



BEHAVIORISM AND CHRISTIANITY



GORDON H. CLARK

Behaviorism and Christianity

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1. John B. Watson

That secular and state-controlled universities propagate non-Christian and Antichristian philosophies is what one expects. I spent forty years in such institutions. But eight years in a Christian college some time ago and more recently five or six years in another Christian college have provided an opportunity to observe sub-Christian, non-Christian, and Antichristian tendencies in Christian institutions as well. Conversations with professors in other Christian colleges have brought corroboration. The points at issue in the early eighties are different from those of the thirties. Today, in addition to other factors which are worth consideration, the psychology or philosophy of Behaviorism notably undermines the Christian faith of the students. Therefore, the subject of this monograph is Behaviorism.

The outline in its briefest form will be (1) the basic position of Behaviorism as expounded by its secular proponents. Some objections will be interspersed, but a more complete refutation will follow; and (2) the position of professedly Christian psychologists who include the same view; and (3) a Scriptural rebuttal.

Naturalism and Behaviorism

The most philosophic, that is to say, the most general statement of the theory which in philosophy is often called naturalism, but which in its psychological application is called Behaviorism, can be found in the presidential address of Ernest Nagel to the American Philosophic Association in 1954. It is essential that this famous paragraph be kept in mind as one reads through the following material in its entirety.

Dr. Nagel's words are these:

The occurrence of events, qualities, and processes, and the characteristic behavior of various individuals, are contingent on the organization of spatiotemporally located bodies, whose internal and external relations determine and limit the appearance and disappearance of everything that happens. That this is so, is one of the best-tested conclusions of experience.... There is no place for the operation of disembodied forces, no place for an immaterial spirit directing the course of events, no place for the survival of personality after the corruption of the body which exhibits it.

This statement is remarkable for its clarity, and, in spite of omitting a line or two, for its succinctness also. Implicit is a philosophy of science. More explicit is the denial of God – no immaterial spirit directing the course of events – and very clearly a forthright rejection of personal immortality. Each word is heavy with meaning. The assertions and denials are sweeping and universal. Anyone who admires superb English style and philosophic precision must recognize its author's extraordinary competence.

The term *naturalism* is a more philosophical term; Behaviorism is its psychological subspecies. The theory also has its political and juridical implications. But this monograph will deal mostly with Behaviorism as a psychological theory and with the epistemological problems it raises. First it is necessary more specifically to document the psychological form of the theory. This too has subspecies. The particularities of the more recent forms may not be completely explicated here. What is in view is the common core of all. To refute Watson or Ryle on some point not acknowledged by other Behaviorists leaves untouched these other types of Behaviorism. The program here is to explain and refute its very basis. The documentation aims to show that this basis is common to all.

It might be hard to pinpoint the origin of Behaviorism, but William James' essay, *Does Consciousness Exist?* with its negative conclusion, is an early statement. A decade or so later Edgar Arthur Singer, Jr. wrote a more philosophical than psychological volume on *Mind as Behavior*. The same year (1924) John B. Watson published his *Behaviorism*, and among the psychologists this book is often regarded as having initiated the movement. Not long after, he wrote *Psychology from the Standpoint of the Behaviorist*. To be sure, Watson refers to William James and others who wrote before World War I; but it is not too much to say that Watson popularized the theory among scholars and among the laity as well. Even today, though

most psychologists no longer regard him as an oracle, there remain a few who still follow him in considerable detail. It is important, therefore, to reproduce some of his main ideas, in his own words so far as is convenient.

Watson rejects the earlier method of introspection as utterly fruitless. He repudiates the idea that “consciousness” is the subject matter of psychology. “Behaviorism claims that ‘consciousness’ is neither a definable nor a usable concept; that it is merely another word for the ‘soul’ of more ancient times.”¹ “No one has ever touched a soul or has seen one in a test tube.” Test-tube chemistry will play an important part in the following discussion; but note first that the reference to touching and seeing presupposes that sensation is the test of truth. All Behaviorism is philosophically empirical. This is a theme that will recur many times in the following discussion. But to return to quotation:

When we have a sensation of red, a perception, a thought, when we *will* to do something, or when we *purpose* to do something...we are being *conscious*. All other introspectionists are equally illogical. In other words, they do not tell us what consciousness is, but merely begin to put things into it by assumption; and then when they come to analyze consciousness, naturally they find it just what they put into it [5].

On the same page, just below the quotation above, Watson rejects the method of introspection: “How do we begin to work upon it? Not by analyzing it as we would a chemical compound....” This remark shows that Behaviorists want to analyze “mind” as they would a chemical compound. In other words, a thought is a chemical reaction. His earlier references to a test-tube confirm this. Behaviorism reduces thinking to observable chemistry.

After mentioning radium, insulin, and thyroxin “and hundreds of others” as examples of testable elements in a laboratory, Watson notes that the Behaviorist “dropped from his scientific vocabulary all subjective terms such as *sensation*, *perception*, *image*, *purpose*, and even *thinking* and *emotion* as they were subjectively defined” (6). Of course Watson himself speaks of sense organs. On page 117 he even describes a cat as “affectionately aggressive.” Above we saw that Singer spoke of “mind.” What we must note is that Behaviorists have changed the meanings of all such words. They still use the word *mind*, but their “mind” is nothing like Plato’s *nous*. This causes confusion, because the employment of common terms gives people the impression that the Behaviorists are talking about commonly received meanings in conformity with good English usage. To understand them aright, the ordinary reader should substitute the word *chemistry* when he finds *perception* or *thought* in their writings.

To quote again: “Why don’t we make what we can *observe* the real field of psychology?” This means, Why don’t we make one test-tube rather than another the real field of psychology? On the Behaviorist theory, observation itself is chemistry in a test-tube. But to continue the quotation: “Let us limit ourselves [limiting is another chemical reaction] to things that can be observed...now what can we observe? Well, we can observe *behavior* – what the organism does or says...saying is doing [that is, moving the larynx and tongue] – that is *behaving*. Speaking overtly or to ourselves (thinking) is just as objective a type of behavior as baseball.”

Even though Watson enclosed it in a parenthesis, he here identifies thinking as sub-vocal speech. Thinking is precisely a motion of the larynx without a sound. This is still further emphasized by his reference to “any change in the tissues themselves due to the psychological condition of the animal.”

Behaviorism and Ethics

Above, the comment was made that Behaviorism has political and juridical implications. Watson acknowledges or boasts that Behaviorism will determine what is moral:

I would like to point out here that some time we will have a behavioristic ethics, experimental in type, which will tell us whether it is advisable from the standpoint of present and future adjustments of the individual to have one wife or many wives; to have capital punishment or punishment of any kind;...whether many of our other prescribed courses of conduct make for adjustment of the individual

or on the contrary, such for example as having a family life or even knowing our own fathers and mothers [7].

Apparently “adjustment of the individual” indicates a type of conduct that is “advisable,” while “the contrary” lack of adjustment is inadvisable. Just how monogamy can be an adjustment of the individual and polygamy not an adjustment, or vice versa, whichever custom Behaviorism eventually approves, is hard to see. But it is not hard to see that Behaviorism is a comprehensive philosophy affecting every possible human interest.

Watson then begins to describe the visible reactions of infants, a subject which fills a large part of his volume; and he notes that a small baby will not go through the motions by which other persons infer he is experiencing fear, but that these motions will occur if a steel bar held just behind his head is struck by a hammer. Of course anyone can observe such behavior; but it does not support the inferences Watson then draws. Watson argues: “Our studies of conditioned reflexes make it easy for us to account for a child’s fear of the dog [at whose presence on several occasions the steel bar was struck] on a thoroughly natural science basis without lugging in consciousness or any other so-called mental process.” If this were true, why would not a tree, a stone, the apparatus in a physics laboratory, or a corpse act in the same way? What is the difference between a live infant and a corpse that accounts for the reaction in the one case and not in the other? Do you say that one is dead and the other alive? What is death and what is life? How can the observations of the motions of a steel bar followed by the observation of the motions of the baby warrant the inference that they are not connected by consciousness or some other mental process? If no mental process is needed, why cannot a corpse be conditioned? How is it that by holding a child’s arms so that he cannot move them “brings out the original unlearned response we call rage”? Conditioned reflexes do not make it easy; rather they make it hard to account for them “without lugging in consciousness.”

Watson himself asks similar question for his readers; but on page 10 he merely states that the commonly received introspective psychology has conditioned these readers to think that way, and that later on in the book he will recondition them to think, that is, to behave, in his way. In fact, he says, “the Behaviorist... wants to control man’s reactions as physical scientists want to control and manipulate other natural phenomena. It is the business of Behavioristic psychology...to control human activity” (11). Thus the aim of Behaviorism is political totalitarianism more crushing of individuality than any tyrant has so far achieved.

This last sentence is not extreme. On page 14 Watson says that the Behaviorist is interested in the whole man; “he watches him perform his daily round of duties.” If the watched subject is a bricklayer, the Behaviorist will determine how many bricks he can lay “without dropping from fatigue.” This is a more efficient program than Pharoah and Hitler were ever able to impose on the Jews. But Behaviorism is not just a methodology for controlling slaves. It claims to be the final philosophical truth. On page 17 Watson claims that philosophy will disappear and become the history of science; ethics will be experimental, “based *entirely* [italics added] upon behavioristic methods; sociology will merge into behavioristic social psychology and economics; and religion will be replaced by experimental ethics. The chapter concludes with his hope “to show you why behavioristic formulations and methods are an *adequate* way of accounting for *all* psychological problems” (italics added).

Although various details of Watson’s views have been abandoned by later Behaviorists, the first chapter, just now reviewed, stating basic aims and principles, remains substantially the position of all Behaviorists. Some of his more important details will now be canvassed, and afterward other authors will be quoted so that comparisons may be made.

Instincts and Emotions

The title of chapter six is, “Are There Any Human Instincts?” The final paragraph of the preceding chapter reproduces an objection to Behaviorism that Watson wishes to answer:

But you say, “That gives the whole argument away – you admit he does a lot of things at birth which he is forced to do by his structure – that is just what is meant by instinct.” My answer is that we must now go to the facts. We can no longer postpone a visit to the nursery. I think you will find there, in the study of the infant and child, little that will encourage you to keep sacred James’ list of instincts [86].

Far be it from anyone to keep James’ list sacred. Furthermore, the question of instincts is not the crucial matter in rejecting Behaviorism. In fact, “unlearned behavior” (75), as Watson calls it, provides better support for Behaviorism than learned behavior.

If an animal has no tear glands, it cannot cry. If it has no larynx or other vibrating membrane, it cannot make a sound. Watson hardly needs all his examples in Chapter VI to prove this much. Hydrochloric acid also exhibits unlearned behavior, as do all chemicals. But this is not enough to establish Behaviorism. Watson wants all this unlearned behavior, and learned behavior too, to take place in human beings as it does in test-tubes – unconsciously. This was Descartes’ theory for animals below the human level. Stick a knife into a dog’s stomach and it will yelp; but it feels no pain. Pat him on the head and his tail wags, but he feels no pleasure. Stick a knife into Watson’s stomach and by the laws of chemistry he will go through certain motions, pretty much as sulphuric acid fizzes when you pour water into it. But has H₂SO₄ or Dr. Watson the equipment a real dog uses when you pat his head?

However, the plausibility lent to Behaviorism by unlearned behavior does no more than disguise the fallacy of the argument. Chapter VI goes into great detail about the behavior of small babies. He described intra-uterine behavior, then sneezing and crying, early eye, hand, and foot movements, and others on pages 87 through 104. Then he asks, “What has become of instincts? Are we not ready to admit that the whole concept of instinct is thus academic and meaningless?” Hardly: The argument does not imply the conclusion. When I pat one dog, and another comes up to bump him aside in order to get his own head patted, does this reduce jealousy to a chemical reaction? What is the chemistry that produces this reaction? In one case, the other dog may be there when I do not pat him, and the second dog shows no jealousy; in another case the first is not there and the second does not insist on being patted. Are the physico-chemical differences in these three cases a sufficient explanation of the differences in behavior?

Watson spends the next chapter on “Emotions.” He begins with Lange’s detailed description of the emotion of grief. Lange lists possibly fifty observable bodily peculiarities of a grieving person. That many of these (weak voice, neck bent, jaw open, contracted vascular muscles, sensitiveness to cold, bitter taste, and copious tears) sometimes occur in grieving persons need not be disputed. The question is, What can be validly inferred? Watson gives Darwin’s description of fear (quick heartbeat, cold sweat, *etc.*), and Mantegazza’s description of hatred (head drawn backward, elevation of the upper lip, spitting, hair standing on end). Watson’s inference is that emotions are all chemistry and no consciousness.

The remainder of the chapter describes the varied reactions of small children to contrived situations. What will a three year old do when a cat comes close? What will a small boy do in a canoe when the water is a little rough? And so on. The descriptions are all varied and the material is very interesting. But can one accept the statement, “These reactions which we have agreed, then, to call fear, rage, and love...?” (123). What was the argument that led to this agreement? I am afraid both were missing.

For example, when a steel bar held behind a child’s head is struck without warning with a hammer, he will jump. So would any adult, not excepting Watson himself. But can one suppose that the air waves have sufficient force to lift 150 pounds a foot off the chair? Try it on a deaf man.

Behaviorism and Politics

The introductory paragraphs of the present study stated that Behaviorism, in addition to its psychology,

had political and juridical implications. Watson's second chapter on emotions documents this point. His views on the subject begin with opposition to punishing children for misbehavior. "Punishment is a word which ought never to have crept into our language" (144). In fact, if the child does anything wrong, it is the parents' fault. Should the parent be punished? "It is our own fault, then, that individuals (other than defectors and psychopaths) go 'wrong'.... I mean the fault of the parent, the teacher, and every other member of the group.... There is no excuse for whipping" (145). If there is any scientific or observational basis for such normative judgments, it must be contained in the sentence,

Conditioned responses are not built up by this unscientific procedure. The idea that a child's future bad behavior will be prevented by giving him a licking in the evening for something he did in the morning is ridiculous [because an eight-year-old child cannot remember that long]. Equally ridiculous, from the standpoint of preventing crime, is our legal and juridical method of punishment administered a year or two later – if at all.

"If at all." Our judicial system is extremely lax in dealing with criminals. Too many are never punished. But this should please Watson. Punishment is a word that should never have entered the language. Further, we parole murderers, who then commit more murders. If society is to blame, it is for paroling them. We may then agree with Watson that a delay of a year or two is bad. But the implication is that punishment should be swift, rather than that there should be no punishment.

In the Dark Ages punishment was swift. But Watson does not favor swift punishment either. "Present methods of punishment for crime are relics of the Dark Ages." In our more civilized times psychopaths, if they cannot be cured in asylums, should be "etherized" (146). Only medieval religious mandates oppose such enlightened executions. The socially untrained (not psychopaths) should be placed in chain gangs, at strenuous labor twelve hours a day, under the direction of Behaviorists (147); only this is not called punishment – it is called social education. "Naturally such a view does away completely with criminal law...with the criminal lawyer...and with courts for the trial of criminals." In their place we shall have Behavioristic law, Behavioristic lawyers, and Behavioristic courts. Indeed, Watson's penology widely controls criminal processes today.

Since Watson's book is largely psychological rather than political and juridical, but since also Behaviorism admits these social implications, it seems proper at this point to interpolate a paragraph or two concerning John Dewey and William Kilpatrick as further documentation.

That Dewey was a Behaviorist and therefore can be cited here as a representative of that school can easily be shown; and it is well known that Dewey called for "the directed reconstruction of economic, political, and religious institutions."² He calls private and personal ends "repulsive."³ He wants science to control the desires of men, "techniques for dealing with human nature as we now have them for physical nature."⁴

Dewey's statements are often very general; his colleague Kilpatrick can be pointedly specific. He opposes as old-fashioned the Americanism that believed the government had a duty to protect private property and maintain unalienable rights. Most emphatically he opposed religious liberty. Not only would he prohibit religious groups from maintaining schools and colleges,⁵ but he also believes it "undemocratic" to allow parents to teach the doctrines of their religion to their own children. Clearly he wants the government to invade the home to enforce belief in humanistic secularism. Unfortunately, since the time he wrote this, the burgeoning bureaucracies have started doing precisely this.

Now to return to Watson, his next paragraph seems to advocate suicide, but the wording is too vague or guarded to nail the point down. One can only suspect that Behaviorism can produce no experimental evidence by which to condemn self-destruction. Should we collect statistics by interviewing people who have not and people who have killed themselves?

Behaviorism and Knowledge

Underneath all these matters from the start lie the problems of epistemology. More fundamentally related to this than is jurisprudence is the question of memory. Augustine centered the personal identity of a man during his earthly life with himself in his life after death, in his memory. Watson, of course, has no time for life after death, but neither has he any place for memory in this life. “The behaviorist never uses the term ‘memory.’ He believes that it has no place in an objective psychology” (177). This statement is at least more honest – though I am not sure that the term ‘honesty’ occurs in a Behavioristic vocabulary either – than those who assign *memory* to computers.

To support his denial Watson appeals to a rat which, by trial and error, finally got through a maze to his food in ten seconds – forty minutes on his first try – and from then on “ran through the maze like a beautiful machine” (177). Watson then records other experimental results, both with animals and children. But how does any or all of this prove that there was no memory? The Behaviorist may want to ask and answer the question, “How accurately can James ride his bicycle now that he hasn’t touched it for five years?” But this question is irrelevant when the main question is, Can anyone remember anything?

Since memory is one form of what ordinary people call thinking, Watson immediately proceeds to “Talking and Thinking, which when rightly understood go far in breaking down the fiction that there is any such thing as ‘mental’ life” (extended title of chapter X).

Language, for Watson, is a complex manipulation of the larynx. Some of his critics have claimed that he defines thinking as sub-vocal speech, that is, such small motions of the larynx as not to produce sounds. This is not quite accurate. In the note on page 180 he says, “man both talks and thinks with his whole body [as Dewey later agreed] just as he does everything else with his whole body” (191). But at any rate, thinking as well as speaking is a complex of physical motions.

Next Watson describes the development of an infant’s vocabulary – all of which is interesting and irrelevant. The real problem is how a sound, a baby’s or an adult’s, can designate an object. Can the chemistry inside a battery *mean* an auto? Especially can the battery in this car designate the car down the street? We cannot induce language responses in a battery; nor even in animals, for Watson acknowledges that language is one of the “learned activities which the brute cannot even enter, much less compete in” (180).

Watson does indeed make an attempt to connect sounds with objects. The baby naturally makes sounds. These sounds are “manual,” that is, physical activities. By chance a baby produces a sound similar to that of an English word. Then we try to tie that sound up to the object the adult means by it. “In the unlearned sounds made by the infant we have all the units of responses which when later brought together (by conditioning) are the words of our dictionaries” (185). But if all this is merely “manual,” why cannot animals enter this field? Many of them have bodily parts almost as complicated as ours, and their chemistry is equally good. And what is meant by “trying to tie that sound up to the object”? How did the adult get the meaning from the sound in the first place? Who conditioned his unconscious chemistry? Indeed, how can chemistry be conditioned at all? Why is it that Watson admits “I know how to make a frog croak by rubbing a certain spot on its body. I can make a dog bark.... I do not know how to ‘press that button’ on his body...which will make the baby say ‘da.’” One can as easily make a baby cry as a dog bark – more easily. But can manual manipulation produce reference and meaning? Even in the case of dogs, is inducing a bark something like inducing a change of valence in a chemical?

Yet Watson holds that words – sounds, or more properly vibrations – produce manual activity exactly as do the objects for which the words serve as substitutes (187). Now, sounds can indeed produce manual activity: Air vibrations presumably cause motions of the ear drums. These motions, however, are not “exactly” the same as the motions in the retina when the object presents itself to the eyes. How can these two quite dissimilar motions represent the same thing? How can either of them *represent* anything? In

answering the question, Watson warns us not to appeal to “memory.” The world of thought, he says, “we carry around...as actual bodily organization in the muscular and glandular organization of our throat, chest, etc.” (187). For the Behaviorist, then, meaning and thinking, we conclude, are literally physical motions in space. And Watson’s description of what other people call memory (189) is no more than this. His note on the next page says, “Almost wherever the introspectionist and so-called functionalist use the term *mental*, we use the natural science term *verbal*.”

Watson explains away the resistance to Behaviorism as a relic of religious training. Then too, “Thinking, on account of the concealed nature of the musculature with which it is done, has always been inaccessible to unaided observation” (191). If we had a good bronchoscope, no doubt, we could see the laryngeal vibrations, or other muscular motions, and recognize them as the theory of relativity!

After several pages describing the motions of people who are “thinking” out a problem, most of which motions are sub-vocal speech, Watson says, “If then you grant that *you have the whole story of thinking when he thinks aloud, why make a mystery out of it when he thinks to himself?*” (198, his italics). The answer to this question which we wish to give here is that we do not grant that physical motions are “the whole story,” or even the most important part of thinking, or even a part at all.

Of course Watson is aware – that is, he has chemical reactions – that critics consider Behaviorism an inadequate account of meaning. He calls this an illogical objection because Behaviorism must be judged on its own premises, and its premises contain no propositions about meaning: “Meaning is just one way of telling what the individual is doing. So the Behaviorist can turn the tables upon his critics. They cannot give any explanation of meaning. He can; but he does not believe the word is needed or that it is useful except as a literary expression” (201).

Watson’s book then ends with a hope for the establishment of a Behavioristic political utopia.

- [1. Behaviorism](#), 3.
- [2. Quest for Certainty](#), 259, 282.
- [3. Reconstruction in Philosophy](#), 157; see also *Philosophy of Education*, 354.
- [4. Problems of Men](#), 178-179.
- [5. Philosophy of Education](#), 354.

2. Edgar A. Singer, Jr.

Edgar A. Singer, Jr., published his *Mind as Behavior* the same year that Watson published his *Behaviorism*. Its first chapter, however, is a paper read before the American Philosophic Association in 1910. The literary style of Singer's writing is too superb for condensation. But a few quotations will help document a Behaviorism more philosophical and more profound than Watson's. Criticize him though I shall, everyone ought to acknowledge that Singer sees the underlying problems much more clearly than nearly everyone else.

Consciousness

After an entrancing analysis of William James' automatic sweetheart – the soulless girl whose behavior is identical to that of a living girl – Singer descends to a few lines of ordinary scholarly prose:

Consciousness is not something inferred from behavior; it is behavior. Or, more accurately, our belief in consciousness is an expectation of probable behavior based on observation of actual behavior, a belief to be confirmed or refuted as any other belief in a fact is to be tried out [10].

Singer immediately acknowledges that he does not know, and does not expect ever to know surely, what aspect of behavior leads us to call certain objects *conscious*. He makes the same admission with respect to *living* objects. "But though I don't know what *life* means, nor what *consciousness* means, I feel that I know how we may go to work to find out." That *how* is empiricism. But it is an empiricism that is not based on sense data.

To those who cannot rid themselves of reliance on sense data,

it is impossible that any analysis of behavior I might undertake should prove satisfactory. The whole idea of my thesis would be simply an absurdity.... It is essential to my thesis that I regard my own mind as behavior, quite as frankly as I take my fellow's mind to be nothing else [12].

Thus Behaviorism begins in blind faith.

Now, some of Singer's argument is directed against the building-block sort of data propounded by Locke. "The beginning of our epistemological building is not a datum which might be known by itself, not, *e.g.*, the first sensation of a babe *in utero* or of a Condillac statue..." (13). Singer's argument on this score is no doubt sound; but his success at this point gives no support to Behaviorism. Such arguments would have pleased Plato too. The modern student, particularly if he has had only one or two courses in philosophy, must avoid being deceived into thinking that the refutation of theory X implies the truth of theory Y. In this case, Singer's disposal of Locke and Condillac leaves one free to proceed in either of two opposite directions. And to repeat, the direction toward Behaviorism depends on the acceptance of certain ethical motives with the rejection of others, as Singer admits on page 14.

If, finally, the concluding pages of the first chapter permit one to summarize the whole, it would be something like this:

The analogy that as my soul controls my body, so the similar motions of another body require an unobservable soul, is an analogy based on a single instance and therefore has no value. Second, I do not assume that any soul produces my bodily motions. But there is another analogy based on many instances. Heat was once explained as a body, caloric, that permeated another body to make it hot. Now science has seen that heat is simply the behavior of the hot body. There is no caloric. Similarly there is no "life" that must be added to a body to make it alive. Life is just the body's behavior. "Consciousness is that trait of the behavior of certain objects which makes me call them conscious...their heat, that trait which makes me call them hot."

At this point the critic raises two objections. The first is a subordinate objection and may not command instant approval. The second is more important. First: The critic complains that Singer fails to distinguish between consciousness, what consciousness means, and the tokens by which one infers consciousness. For the critic the question, What leads me to call a man conscious? and the question, What does consciousness mean? are two different questions. Singer replies, "They are to me the same. I confuse, I identify the [two questions].... And I detect the same lack of intellectual scruples in other situations. I am inclined to confuse the question, What leads me to call this thing a triangle? with the question, What does triangle mean?" (27). On this premise Behaviorism seems to follow. Perhaps it does not follow. But at any rate the second and more important point is that this empirical philosophy cannot stand the test of experience. Singer admitted that he does not know and does not expect ever surely to know, what aspect of behavior leads us to call certain objects conscious, or even living. But if the empirical evidence is defective, then Behaviorism is not based on observation. It is a subjective preference.

The second chapter, "On Mind as an Observable Object," mainly concerns an objection that need not be pursued. But one or two incidental remarks corroborate the main thesis. One is the acknowledgment that Behaviorism requires its advocates to take a position on ethics. A more important point is Singer's denial of an immortal soul – not the immortality of Shakespeare's plays, but the immortality of Shakespeare himself as an individual. In answer to this suggestion Singer replies, "Just now there faces me an issue more vital than the destiny of souls after death – it has to do with the nature of souls during life" (35).

In this statement lies an ethical interest and a normative judgment contrary to those found in other philosophies. Plato the pagan and Augustine the Christian would say that there is no more vital question than the destiny of incorporeal souls after death. No doubt both are interested in the nature of soul during this earthly life. But Singer assumes that this latter can be known without knowing the former. Now, no one can object to an analyst selecting the incarnate phase of the soul for study. But to say that life after death is less important is to beg the question. One might well say, on the contrary, that if the soul is not immortal, there is not much gained by analyzing its present status.

After complaining that one of his critics "refuses to identify any sort of motion of atoms with a thought, and this makes the whole thing trying" (36), Singer seems to fumble in describing the position of his opponents. In desperation, so to speak, he exclaims, "Will any theory that substitutes a *Ding an sich* for observable phenomena ever win to extinction?" (37, 38). This is not an error when it is directed against theories that posit unknowables. A transcendental unity of apperception, if it be a *Ding an sich* beyond the reach of logical categories is useless. Hegel once and for all disposed of Kant's unknowable, but this did not make Hegel an empirical Behaviorist. An attack on Kant does not refute Augustine or Calvin, any more than it refutes Hegel. In these latter the soul or mind is not a *Ding an sich*. If there be any *Ding an sich* around, they are more likely to be the so-called observable objects. Singer may have disposed of Kant, but he leaves Plato untouched. One thing is indubitable: Singer in his refutation documents the Behavioristic thesis that thought is some kind of atomic motion.

It is true that Singer wishes to avoid over-simplification; he will not explain thought as *nothing but* atomic motion. A merely mechanical description falls short. Some combinations of mechanical motions can be described as teleological, while simpler combinations cannot. Mind must be found in the more complex combinations.

In reply to a hypothetical opponent Singer says, "Detail by detail these atomic movements may be classed with other atomic movements whose class has no common function" (48). In a footnote he adds, "The non-mechanical classification of these [more complicated] events leads to a new order of expectancy. This, their teleological, is also their psychological interpretation." An example clarifies the statement. One can easily give a mechanical description of every wheel: locomotive wheels with a

certain diameter, airplane propellers, bicycle wheels of a different diameter, and wheels in watches. The sensitivities of Behaviorists prevent us from including Ezekiel's wheels. But from the mechanical description of the others one could conclude only that wheels *as a class* have nothing to do with chronometry (47, 48). However, in addition to their mechanical description, the wheels in watches have the function of keeping time. Thought is presupposed in this teleological classification.

Nevertheless the motions are mechanical: "I should begin by looking for such movements of atoms as actually moved (too slightly for us to notice it) the organs of expression: the tongue, principally, and the eyes" (48-49).

Singer is far more philosophical and profound than Watson. Instead of dabbling in irrelevant experimentation, he recognizes that Behaviorism must define *life*, *sensation*, and *mind*. There must be a consistent system of definitions. Therefore, Singer writes one chapter on "The Pulse of Life" and another "On Sensibility." At the beginning of the former he restates the basic presuppositions. "To assert the existence or non-existence of anything is meaningless unless we can verify the assertion." This sounds very much like Logical Positivism.¹ "But experience is the only means of verifying assertions, and behavior the only aspect of the beings we call living or conscious which is matter for experience" (53).

Materialism and Purpose

While Singer insists that all motions in the universe are mechanically determined, that is to say, there are no exceptions whatever to the laws of mechanics, he nevertheless wants to avoid the charge of being a materialist. A theory of life must be consistent with the mechanical ideal of physics, but life must not be mechanical, that is, defined in mechanical terms. Materialism, in his terminology, is a theory that so defines life:

If everyone is a materialist, who refuses to look upon the contours of a living being as the boundary of a region in which the kind of predictability that hold outside of it [differential equations] breaks down, then I am a materialist along with Spinoza and Kant. If, on the other hand, a materialist is one who attempts to give a *mechanical definition* [italics added] of life, then, unlike Democritus or La Mettrie, I am no materialist [56].

Singer's grasp of the problem is so comprehensive that he leaves the purely psychological Behaviorists far behind. In general they do not see what is involved and therefore cannot offer a consistent solution. Singer speaks of their confusion, and of course the confusion of others as well.

"The confusion usually attended on this method of defining comes, I think, from our failure to keep distinct the two classes into which a single individual may fall, when one of these classes is defined without reference to purpose" (57). One of his frequent examples is a pocket watch. This can be classed mechanically with all other wheels. But it can also be classed with all other chronometers, even though some have no wheels at all. This latter is a teleological, not a mechanical classification. Similarly the human body can be classified chemically and mechanically with an infinite number of other chemical phenomena; but it can also be classed teleologically without reference to chemistry and physics. Life, like chronometers, must be defined by its purpose:

Materialism is nothing but an attempt to define life in terms of mechanism.... But there is nothing in the way of mechanism common to all that is or might be called living, and the living world would never be put into a single class were they not moments in a scheme of purpose: The class of living-being has nothing but a certain purpose common to its members, and only this purpose can be offered as the definition of life [59-60].

A Christian or a Platonist, or even a Hindu, upon reading this quickly, might welcome the reference to teleology. It sounds encouraging to hear that living beings have nothing in common except a certain purpose. But there are two difficulties here, difficulties that a quick reading might miss. Singer has defined purpose as a result that occurs twice, or more, with two or more bodies. If a bee stings a man and

a second bee stings a second, then the purpose of these two bees is to sting people. Perhaps this is not fatal, for one can eke out a fuller purpose by adding honey to the sting. But if one falling stone splashes into a lake and another into another lake, shall we say that the purpose of stones is to splash? In other words, a Christian or a Platonist will not be satisfied with Singer's underlying definition of purpose.

There is, however, a second and more serious difficulty. Even on Singer's own principles it is not true that "the class living-being has nothing but a certain purpose common to its members." Nor can he maintain the position that "there is nothing in the way of mechanism common to all that is or might be called living." On the contrary, there is common to all living beings the basic laws of physics whatever they may be. Newton's law of gravitation used to be thought common to all bodies; today some Einsteinian law, or maybe Schrödinger's equations are held to be universally applicable. Hence Singer has said more than his own principles allow.

Indeed, Singer's favorite example of watches and chronometers is decisive. It may well be that not all chronometers have wheels. There is no single blueprint that pictures them all. But every one of them individually is mechanical. Not a single motion of any but that is determined by the laws of mechanics.

I do not suggest that Singer would have denied this. He takes pleasure in the literary paradox that *all* chronometers, that is, the class of chronometers, are non-mechanical, though *each* chronometer is mechanical. Later we shall see how a professing Christian author makes use of Singer and Spinoza, without perhaps realizing what he is doing.

Spinoza, Singer, and the other gentlemen want to preserve human freedom. Freedom is a good word and ought to be preserved. But only a definition can tell what is being preserved. Following Spinoza, Singer defines freedom as "the invariance of purpose [as *purpose* has already been defined] in a variety of mechanical situations." He expressly rejects the notion that freedom is the "possibility of doing different things under the same circumstances" (61).

The serious student is well advised to read Singer's full account, but here lengthy quotations must end and a hasty summary begin. Singer defines purpose as the average common result of a number of processes. If three things, unlike mechanically, sometimes produce the same result, those three things can be classified teleologically with that result as their purpose. Sundial and wristwatch are the examples. Their purpose or average common result is to keep time. The purpose of life is self-preservation. If a number of objects (always more than one) go through certain motions which result in their going through the same motions again, those objects are alive. Thus Singer defines *freedom*, *purpose*, and *life*.

But an irreverent soul might ask, Does not an internal combustion engine explode a gas mixture from the carburetor in order to explode it again, and again, until the engine finally dies?

Singer next writes a chapter "On Sensibility," followed by one with the mathematics for measuring the intensity of sensation. We shall skip the mathematics, though a brief account of sensibility will round off his theory of life.

Sense and Sensibility

The necessity of studying sensibility lies in the fact that a Behaviorist not only wants to define *life*, he also wants to define *mind*. At least a philosophic Behaviorist does, even if some psychological Behaviorists fail to recognize the systematic problem. Watson was an excellent example of unsystematic disorder.

Singer reiterates his principles that an empirical definition must leave no doubt "what experiments would inform us whether anything corresponding to our definition existed or no" (77). "The criterion of mind constitutes its definition" (79).

To begin with, mind is a higher form of life than others because it denotes a greater resourcefulness in

self-preservation. To make the first step upward in the degrees of resourcefulness, one must distinguish between plants and animals by the phenomena of sensation. Singer was a master of literary grace, even in his most technical paragraphs. Here he has the Sun rising on Austerlitz, with inanimate matter reacting physically because of the heat, with infusoria and animalcules in a pond stirring according to their several tropisms, but also with an Emperor viewing the scene after the fashion of a Napoleon.

There are therefore ranks of mind above simple sensation, but simple sensation must be explained first in order to begin the ascent. The Emperor's gesture was indeed conditioned on the Sun's rays; but whereas the infusoria reacted only to the warmth, the stimulus in Napoleon's action included all of Europe and even a fair share of the world.

Nevertheless, the infusoria exhibit sensibility, which now leads to their definition: "Any body that reacts with a purpose we call its own to a change of mechanical conditions within its contours displays sensibility, or has sensation" (84).

Since obviously there are degrees of sensibility, the problem is to measure those intensities. As an approach to a solution of this problem, Singer considers the intensities of light, Fechner's work, the avoidance of Weber's law, and an equation that looks like

$$I_e = a \log. \frac{r - r_o}{r_w - r_o}$$

plus a following chapter of other equations. He also describes an experiment on paramecia to illustrate pure sensibility; and he draws an inference to "man's chance of life at a given moment" (92).

The remainder of Singer's *Mind as Behavior* is extremely interesting. He works out his theory in many details. But to discuss them further is not essential to this monograph. What has been said here accomplishes two things: It documents the theory of Behaviorism and shows how superior Singer was to his contemporaries of the 'teens and 'twenties.

[1.](#) See my monograph, *Language and Theology*.

3. Gilbert Ryle

Next we come to Gilbert Ryle.¹ Like Singer and unlike Watson, also unlike Skinner, Ryle shows some philosophical competence. His style is his own. Singer is very polite in referring to his opponents; the other two often beg the question. Ryle is the happy warrior, delightfully brutal, “excessively polemical” as he puts it (9), a man whom his enemies can admire.

The Ghost in the Machine

His first chapter states the position he aims to destroy. “Descartes’ Myth” is painted boldly in vivid, repellent colors. The difficulty with dualism is starkly focused. “Human bodies are in space and are subject to the mechanical laws which govern all other bodies in space.²...But minds are not in space nor are their operations subject to mechanical laws” (11). Since the mind is in no way spatial, Ryle twits those who speak of it as being *inside* the body. But even when *inner* and *outer* are taken metaphorically, the operation of a non-spatial mind on a body, and of a spatial body on a mind, defies all explanation. Besides, it is not at all clear how one mind can affect another mind. “Only through the medium of the public physical world,” Ryle insists, “can the mind of one person make a difference to the mind of another” (13).

After two or three pages describing the dualism, Ryle continues, “Such in outline is the official theory. I shall often speak of it, with deliberate abusiveness, as ‘the dogma of the Ghost in the Machine’” (13-14). This dogma is throughout a “category-mistake.” He gives some examples: As a father and his young son watch a military parade, the father points out a battalion, a battery, a squadron, *etc.*, and then the boy asks, But where is the army? The boy here makes a category mistake because he thinks the army is another unit similar to but partly different from the units already seen. People make category mistakes because of “their inability to use certain items [concepts] in the English vocabulary.... My destructive purpose is to show that a family of radical category-mistakes is the source of the double-life theory. The representation of a person as a ghost mysteriously ensconced in a machine derives from this argument” (17-18).

Now, it may be true that the dualistic scheme Ryle describes is as absurd as he says it is; yet this alone is not sufficient to establish Behaviorism. Ryle’s argument here, and in the illustration of the military review, depends on an unacknowledged presupposition. How can there be a ghost in the machine, if there is no machine? Since Ryle uses the spooky phrase every so often in his book, let it be said here that there is no necessity of considering the human body or the physical world as a machine. Hume suggested that it might be a cabbage. The majority, or at least many of the philosophers in the past have considered the universe to be a living being, rather than considering the human body to be inanimate, non-souled matter. This is not to deny that physicists formulate mathematical equations. But the philosophy of Operationalism does not take these equations as descriptions of an external world. Behaviorists, on the other hand, generally accept the mechanical view of nature as (with a few modifications) described by the nineteenth century disciples of Sir Isaac Newton. But the space that Ryle relies on has now disappeared into a Black Hole, and matter has exploded into a mysterious Energy. If the planet Earth were solid, it would be the size of a golf ball, and gravitation is as impossible as Newton himself knew it was. The ever-accelerating flux of physical theory may not necessarily refute some form of Behaviorism. It does, however, refute many of the arguments contemporary Behaviorists use. The fact that the little boy (more stupid than most) made a category mistake does not guarantee that someone else did.

If, however, we refrain from pressing these more fundamental questions at the moment, the Behavioristic position is clear: “When we describe people as exercising qualities of mind, we are not referring to

occult episodes of which their overt acts and utterances are effects; we are referring to those overt acts and utterances themselves” (25). Bobby Fischer’s genius consists in the motions of his fingers as they pick up chess pieces and put them down on other squares. Ryle should not object to my excessively polemical example, chosen with deliberate abusiveness and destructive intent, for on the same page he states his aim to examine such concepts as “clever,” “inventive,” “acute,” “witty,” “judicious,” and so on. Indeed, within a few pages he himself uses the example of a chess player.

Anti-Intellectualism

In these pages Ryle wishes “to correct from the start the intellectualist doctrine which tries to define intelligence in terms of apprehension of truths in terms of intelligence” (27). The statement of this aim is not very clear. By what follows we surmise that he wishes to deny the Platonic distinction between knack and knowledge, between knowing *how* and knowing *that*. Chess seems to become something like playing the piano. The chess player must train his fingers to pick up the right piece. Touch move. The philosophy-player might ask whether Ryle knows *that* there is no important difference between *how* and *that*. He does indeed say, however, in the same paragraph with the chess player that “the intellectualist legend is false and that when we describe a performance as intelligent, this does not entail the double operation of considering and executing” (29-30). But the remainder of the page is not what one would expect a chess player to write. Chess players do consider before they pick up a piece. Touch move.

The next dozen pages are presumably the main argument, not merely against an impossible semi-Cartesian dualism, but against all forms of intellectualism; and conversely the proof of Behaviorism. These pages are hard to summarize, and the serious student should read them for himself. The omissions in the following condensation are matters of judgment.

Ryle begins by noting that a witty person is obviously intelligent, though he cannot state the intellectual rules that guarantee amusing remarks. The witty person knows how, but does not know what. Men argued logically long before Aristotle formulated the rules of logic. Practice, therefore, precedes theory. Isaac Walton fished intelligently before he could teach the rules of angling. Hence these intelligent operations did not require intellectual understanding.

From these acknowledged facts Ryle produces an argument to show that intellectualism is logically absurd. This argument is first condensed into a short paragraph:

The consideration of propositions is itself an operation the execution of which can be more or less intelligent, less or more stupid. But if, for any operation, to be intelligently executed, a prior theoretical operation had first to be performed intelligently, it would be a logical impossibility for anyone ever to break into the circle [30].

The next paragraph expands the argument, and this expansion will be considered. But first let us examine the shorter statement. It is an assertion that intellectualism is vitiated by an infinite regress. Ryle’s argument, however, hides a shift in reference, depends upon this ambiguity, and is therefore fallacious. His words, as quoted, are, “If for any operation to be intelligently executed, a prior theoretical operation had first to be performed intelligently, it would be a logical impossibility for anyone to ever break into the circle.” There are several difficulties in these words. First of all, he should have said, “If any *overt physical* operations are to be intelligently executed, a prior internal, theoretical, intellectual operation would be necessary, and then another prior to that, and so on backward.” By his omission of the words *overt*, *physical*, and *intellectual*, Ryle achieves plausibility. But if an overt physical action requires a prior intellectual act, it does not at all follow that a prior-prior intellectual act is needed. Ryle has assumed that the sequence of intellectual acts necessitates the same conditions as the sequence of corporeal acts. In particular, he assumes that the sequence “intellectual-intellectual” is subject to the same conditions as “intellectual-physical.” Unless he can prove his hidden assumption, his argument as stated

is a fallacy.

In the next place an intellectualist sees no way by which to prove that assumption, for the term *intelligent* does not mean precisely the same thing when attached to a physical motion as when attached to a process of thought. The physical motion is intelligent only in the sense that it executes an intelligent mental plan. But intelligent mental planning is intelligent in its own right. Motions are intelligently performed only when mentally controlled; strictly it is not the motion, but the man, the man's mind, that is intelligent.

One may interpolate the *ad hoc* remark that Behaviorists should not object to infinite regresses. On their theory every physical action requires a previous physical action and, like the fleas on the dog, so on *ad infinitum*.

Ryle's next paragraph, as was indicated, expands his argument; and it is only fair to consider whether the expanded argument avoids the fallacy. To quote:

According to the legend [of intellectualism], whenever an agent does anything intelligently, his act is preceded and steered by another internal act of considering a regulative proposition appropriate to his practical problem. But what makes him consider the one maxim which is appropriate rather than any of the thousands which are not? Why does not the hero find himself calling to mind a cooking-recipe, or a rule of Formal Logic? Perhaps he does, but then his intellectual process is silly and not sensible. Intelligently reflecting how to act is, among other things, considering what is pertinent and disregarding what is inappropriate. Must we then say that for the hero's reflections how to act to be intelligent he must first reflect on how best to reflect on how to act? The endlessness of this implied regress shows that the application of the criterion of appropriateness does not entail the occurrence of a process of considering the criterion.

Since Ryle, not only on this page, but *passim*, considers this one of his main arguments, if not the most fundamental of all, we cannot pass it by without remark. There are several remarks to be made.

First, and least important, this argument in no way supports Behaviorism. If it were valid, it might show that no one thinks intelligently, but it would not show that no one thinks.

Second, and this may be considered as a single objection or as a series, there is an ambiguity in Ryle's use of the term *intelligent*. The one sentence on which his argument depends, and which at the same time is so plausibly true, is "Perhaps he does [call to mind a cooking recipe or a rule of Formal Logic], but then his intellectual process is silly and not sensible." There are, however, two vastly different situations, in one of which such random thinking would be silly, in the other of which it would be eminently intelligent. If a mechanic is familiar with automobiles, and if a car swerves to the left when the brake is suddenly applied, it would be silly of him to think about cleaning the air filter or filling the gas tank. He does not go at it at random, but begins by taking off the wheel and inspecting the brakes. This is because he already has a good knowledge of auto mechanics. But when Edison tried to produce an electric bulb, he had no such extensive knowledge. No doubt he guessed that an elephant tusk would not be a suitable filament, but there were hundreds of things that would at least fit into the bulb. So he tried one after the other pretty much at random. This was an intelligent procedure. Or consider cancer research early in this century. With almost no knowledge the medical researchers had to make random experiments. After these experiments had been completed, the degree of randomness diminished; and to have repeated some of the experiments, or to have tried snake oil again, would have been silly. But whether random action is silly or intelligent varies with the degree of knowledge. In still earlier situations a man may know that something must be done to avoid a disaster without having the least idea of what is suitable. In this primitive case he may indeed try a cooking recipe or a rule of Formal Logic. He will perish if he does nothing; doing something is his only hope. No matter how silly that something may appear years later, it was at the time an intelligent action.

Even beyond the primitive level the same considerations apply, no doubt, to Pythagoras when he first tried to prove his famous theorem. Of course he already knew some theorems of geometry. But not this new one. He knew also that it would be silly to draw curved lines. But I suppose that after having drawn

his triangle, he tried drawing one straight line after another, until he saw how to work it out. Being a genius he did not have to make so many false starts as I would have had to make, but even a genius presumably considers one or two possibilities before he hits upon the right answer. Today a mathematician knows that those possible lines are silly. They were not silly in 500 BC.

There is another and deeper flaw in Ryle's argument. He has attempted to refute rationalism on its own ground. He believes that the principles of rationalism or intellectualism necessitate an impossible infinite regress. But in so arguing he forgets an essential point. As an empiricist he naturally, or, by second nature, automatically and habitually starts the learning process with a blank mind – or should I say a blank body? But rationalists do not. They start with innate Platonic Ideas, *a priori* Kantian categories, or some other form of original intellectual equipment. The intelligence is already there at the start. No infinite regress is needed to find it. Let no one dismiss this criticism of Ryle by saying that the regress still is there, since the decision to act thus and so requires a prior investigation of what intelligence requires, and so on back. It is the original intellectual equipment, the equipment that makes a man human, in which the criteria of intelligence are found. It operates, not automatically, not by second nature, but by nature, the nature of the mind itself, by its structure, that is, by innate logic and rationality. Of course, Ryle does not accept this intellectualist position, but he cannot convict it of an inherent self-contradiction by ignoring one of its basic principles.

There are people who underestimate the importance of basic principles and who are greatly impressed with subsidiary details. These people will be happy now to examine some of Ryle's details. He tries to discover "The Motives of the Intellectualist Legend" in processes called skillful, cunning, and humorous. The intellectualist notes that a parrot can repeat a joke, but no one attributes intelligence to him. But the fact that there is no audible difference between the parrot's sounds (at least no more than between the sounds two human beings make – the words are understandable) and those of the witty person, does not imply that the human being, says Ryle, has performed some extra secret acts (33). The skill of a clown is not an act. Skill cannot be photographed. But this is not because skill is an occult or ghostly happening; it is not a happening at all. Just as the habit of talking loudly is not itself loud, so skills are neither overt nor internal. The intellectualist wants to explain habit and skill by previous and present thinking.

Ryle rejects the ghostly notion of mind by explaining these phenomena as the unseen motions of internal bodily organs. *Mental* arithmetic, for example, is sub-vocal speech (35). Though the sounds the parrot makes are sufficiently well pronounced to be English words, the parrot's physiology is different from a man's.

Many Behaviorists – Singer is an example – insist that the qualities of a complex are not usually the qualities of the elements. Thus they hope to preserve "mind" from mechanistic laws. Nevertheless their "thinking" is the functioning of physical parts. John Dewey somewhere compared thinking with digestion. Digestion is not itself the stomach: It is not a material thing. It is the functioning of a material thing. So too thinking or soul or mind is not a material, and much less an immaterial, thing: It is the functioning of the body. Thus, however complicated the chemistry may be, thoughts are the chemistry of physical bodies.

Ryle tries to uncover the intellectualist's confusion in describing mental acts done in one's head. Of course an intellectualist does not hold that thinking is done in one's head. He sharply distinguishes between the brain and the mind. But at any rate there is nothing I can see in the dozen pages of this chapter to contradict the proposition that Behaviorism identifies thinking as physical motions. In fact Ryle says, "When people employ the idiom 'in the mind' they are usually expressing over-sophisticatedly what we ordinarily express by the less misleading metaphorical use of 'in the head.'" This makes the Behaviorist's position clear enough, though, be it noted, that ordinarily I say "in my mind," and hardly ever, perhaps never say, "in my head."

That much of what Ryle says on these dozen pages is irrelevant to the establishment of Behaviorism may be recognized when the intellectualist agrees with what he says. “The statement ‘the mind is its own place’...is not true, for the mind is not even a metaphorical place” (51). The intellectualist agrees. “...the chessboard, the platform, the scholar’s desk...are where people work.” True, though not the whole truth. “‘Mind’ is not the name of another person, working or frolicking behind an impenetrable screen.” Again the intellectualist agrees, emphatically. “It is not the name of another place...another tool.” Of course. But if the intellectualist agrees with these concluding statements, it must be because Ryle’s arguments are largely irrelevant. No, the mind is the person, and the body is in some sense the person’s tool.

Ryle, more loudly than Singer, explodes the analogy argument, namely, that I know the connection between my mind and my body, and, therefore, when I see another body with two legs, two arms, and a head going through motions similar to mine, I infer that these motions result from a directing soul. This inference is clearly fallacious. It deserves all that Ryle and Singer say against it. From this undeniable analysis Ryle presses on his opponents the accusation of skepticism. Two replies to this accusation are possible. First, an argument may be utterly fallacious, and yet its conclusion may be true. Ryle has destroyed only the argument. Second, if skepticism is indeed the result, does that prove Ryle’s Behaviorism? That inference is also a fallacy. Furthermore, in the present writer’s opinion, all empiricism results in skepticism. Ryle dogmatically asserts, “Understanding a person’s deeds and words is not therefore any kind of problematic divination of occult processes. For this divination does not and cannot occur, whereas understanding does occur” (54). Einstein presumably would not agree.³

After several more pages of objections to the analogy argument, Ryle makes a statement that can be taken as a conclusion: “Overt intelligent performances are not clues to the workings of the mind; they are those workings” (58). This sentence documents the Behaviorist’s basic position that thinking is the motion of physical bodies.

Volitions and Decisions

As was indicated earlier, some of Ryle’s sentences are quite acceptable to intellectualists, and therefore do not advance his argument. Other sentences, dogmatically asserted, seem obviously false.

One such concerns acts of will: “No one ever says such things as that at 10 a.m. he was occupied in willing this or that, or that he performed five quick and easy volitions and two slow and difficult volitions between midday and lunch time” (64). Now, Ryle’s wording here is a bit pejorative, but frequently enough one may say, “at 10 a.m. I decided to do so and so.” For example, in my financial condition am I justified in buying a chess computer for \$300? At ten o’clock I may recklessly decide, Yes. Now, I may not write the check and mail the letter until 3:00 p.m. But I willed to buy the computer in the morning. Thus the truth of some of Ryle’s premises is not unquestionable and in fact implausible. Ryle asks rhetorical questions he thinks unanswerable. Are they?

At which moment was the boy *going through* a volition to take a high dive? When he set foot on the ladder? When he took his first deep breath? When he counted off, ‘One, two, three – Go’ but did not go? Very, very shortly before he sprang? What would be the answers to those questions?

These questions are not unanswerable. If they appear to be, it must be because different boys would give different answers. But this type of rhetorical question does not contribute to the plausibility of Behaviorism. The sentence, “If ordinary men never report the occurrence of these acts...” (65), surely presupposes that they never do. But though I cannot now remember the date of that spring day in 1924, I distinctly remember making a very important decision at that time. I also remember making a decision at a given moment about three weeks ago. Other people report the same sort of thing. Ryle therefore bases at least some of his arguments on false premises.

The use of false or at least implausible premises is somewhat frequent. Still discussing volition Ryle says,

Most voluntary actions do not issue out of conditions of indecision.... [Really?] Moreover, it is notorious that a person may choose to do something but fail...because some circumstance arises preventing the execution of the act chosen. But the theory could not allow that volitions ever fail to result in action [68].

This last statement is obviously false. Furthermore, in the case of a person who has been suddenly but unconsciously incapacitated, the fact that he cannot execute his will rather supports than refutes the intellectualist theory. It emphasizes the distinction between the mental act of volition and the physical motions of the arms and legs.

Some of Ryle's conclusions are based on the ordinary usage of English; but through the book there is vacillation. Although he tries to refute intellectualism by ordinary usage, he finds himself also refuted. "I do not know the right idioms in which to discuss these matters, but I hope that my discussion of them in the official idioms may have at least some internal Fifth Column efficacy" (201). But Ryle cannot have it both ways. Either all his arguments against intellectualism on the basis of ordinary language are fallacious, or Behaviorism is completely refuted by that same language. Now, besides his questionable dependence on ordinary language, Ryle sometimes fails to recognize what ordinary language is. For example,

In their most ordinary employment 'voluntary' and 'involuntary' are used, with a few minor elasticities [whatever this may mean], as adjectives applying to actions which ought not to be done. We discuss whether someone's action was voluntary or not only when the action seems to have been his fault.... In this ordinary use, then, it is absurd to discuss whether satisfactory, correct, or admirable performances are voluntary or involuntary. We neither...plead "guilty" nor plead "not guilty;" for we are not accused [69].

These quoted lines are so obviously false that one can hardly believe that even a Behaviorist would write them. There are important and there are trivial examples to the contrary. Just above I referred to a spring day in 1924 when I made an important decision that affected the whole course of my life, and it was a decision that most people would acknowledge to have been good, and surely not something that ought not to have been done. No doubt everyone sometimes makes decisions that result in actions that should not have been done. But does no one ever make a good decision? A trivial example also shows that it is not absurd "to discuss whether satisfactory, correct, or admirable performances are voluntary or involuntary." One may carelessly and by accident say something exceedingly witty. Now, it might not be polite, but it is not absurd, especially if the person is not usually so witty, to ask, Did you intend that wit, or was it accidental? Take the case of someone's giving a large gift to a charitable institution. This would seem to be a good act. Yet it is not completely absurd to ask, Were you coerced, shaken down, threatened into making that donation? The donor may reply, No, I was not threatened, I deliberately did this good deed. Many times in ordinary life a person wants to judge of another person's guilt; but sometimes he wants to judge of the other person's merit. Ryle actually admits this possibility, but rules it out as non-ordinary. It is used only by philosophers in an "unwitting extension of the ordinary sense." As an example of such a meritorious action Ryle chooses the very simple case of a boy getting the correct answer in an arithmetic examination. Since we say a voluntary wrong act could have been avoided, we ought to say a voluntary right act could have been avoided. Could it? Ryle asks this question at least five times in four lines and concludes, "In fact, however, no one could answer these questions" (70). Nonsense! As a professor I give scores on a series of quizzes and determine the letter grade at the end of the semester by (roughly) the bell-shaped curve. This allows the class more or less to establish a passing grade. Since thus a poor student may pass because there are two or three worse, it follows that it is possible for a student to make deliberate mistakes so that his friend has a better chance of passing. This is unusual, but neither impossible nor absurd. The one who deliberately fails – that is, deliberately avoids doing the right act – may so choose, not only because he wants his friend to pass, but also because he has just inherited a fortune and is no longer interested in a degree, or because he intends to commit suicide that evening.

Admittedly these two motivations are rather rare, but they are not impossible. A more plausible instance is that of a student who has already flunked so many courses that an extra F is meaningless. However, he happens to know this course fairly well. But he deliberately avoids the right act, puts down what he knows to be wrong, to help his friend get a C. This is not silly nor impossible, and I suspect it has happened once or twice.

I submit that Ryle's statements on page 70, especially the bottom half, are false. Similarly in other sections too. For example, "'unnoticed pain' is an absurd expression, where 'unnoticed sensation' has no absurdity" (203). In any case an empirical philosophy has no basis for asserting a universal proposition. No one by statistics or induction can determine that it is impossible for a good math student to put down the wrong answer involuntarily.

Realizing that his opponents are scared of "The Bogy of Mechanism" (76), Ryle tries to show that "The fear that theoretically minded persons have felt lest everything should turn out to be explicable by mechanical law is a baseless fear"; and he does this by an extended, over-extended, analysis of chess. He notes that without having read or heard the rules, an observer can determine that a bishop always moves diagonally and must therefore come down on a square whose color is the same as that of the square from which it started. "Knights always make doglegged moves. And so on." These rules are unbreakable. But the rules of chess, Ryle emphatically notes, do not predict on what square the bishop stops, or even whether a knight is moved rather than a bishop. "There is plenty of room for us [the players] to display cleverness and stupidity and to exercise deliberation and choice." After a page of this he concludes, "What the illustration is meant to bring out is the fact that there is no contradiction in saying that one and the same process, such as the move of a bishop, is in accordance with two principles of completely different types and such that neither is 'reducible' to the other, though one of them presupposes the other" (78). He then elaborates the illustration of the rules of grammar, which of course do not determine what subject you choose to speak about.

But while his explicit conclusion is true enough, namely, that rules of chess do not determine the precise square on which the player will place his bishop, this is not the conclusion required. For while the rules of chess do not determine the precise motions, the rules of mechanics do. The Bogy of Mechanism is not dispelled by the fact that the rules of chess cannot predict the course of the game: In the philosophy of mechanism every move of every game has been mechanically determined. That we are able to describe these moves with some superficial non-mechanical terms does not at all save us from mechanical determinism. Indeed the motions of our larynx, producing the sounds called "non-mechanical description" are themselves mechanically determined. This egregious oversight on Ryle's part is repeated in his illustration of billiards. He is willing that the balls, once set in motion, follow the laws of mechanics; but he tries to rescue the player. This cannot be done. In a Behavioristic, mechanical system, the motions of the player, as well as of the billiard balls, are predictable by mathematical equations.

Yet it is difficult to disengage Ryle's actual theory of nature. He asserts,

Men are not machines.... [There] are very few machines in Nature. The only machines that we find are the machines that human beings make, such as clocks, windmills, and turbines. There are a very few natural systems which somewhat resemble such machines, namely, such things as solar systems [81-82].

To these assertions we must put a question: Does Ryle really hold that some physical motions are exceptions to or violations of the equations of physics; or is he using the word *machine* in a very loose popular sense so that the Bogy may have a closet to hide in?

Knowledge and Communication

In a monograph such as this, it is the deficiencies in the opponent's argument that are emphasized. This

does not mean that the critic is unaware of some excellencies. Ryle often appeals to common language usage, and this is frequently a defect. At other times it points out common confusions. In opposition to the idea of an immediate awareness of mental states Ryle says,

It is nonsense to speak of knowing or not knowing this clap of thunder or that twinge of pain, this colored surface or that act of drawing a conclusion or seeing a joke; these are accusatives [except perhaps the joke] of the wrong type to follow the verb "to know." To know and to be ignorant are to know and not to know that something is the case, for example, that that rumble is a clap of thunder or that colored surface is a cheese rind. And this is just the point where the metaphor of light [internal illumination] is unhelpful [161-162].

The metaphor of light is an ancient one. It seems to be implied in Parmenides and Plato; Plotinus of course used it on a cosmic scale; and Bonaventura referred to "global representations." Hegel had much the same idea in substituting concepts for propositions. But Ryle's rejection of individuals, such as the perception of yellow, and his replacing them with propositions, such as "the yellow is a cheese rind," hardly eases the path of Behaviorism. It rather enforces intellectualism. If Behaviorism has trouble with the consciousness of yellow and pain, it has little hope of developing propositions from nervous wiggles. Physiology may perchance be able to explain the production of sounds, but it has made no progress in explaining their meaning. There are two cases: The same sounds may have different meanings; and different sounds may have the same meaning. The words of one man's profanity could be the words of devout worship in another man's mouth. Or, second, one man makes the sounds, "the dog is clever"; other motions, no doubt of a similar larynx but yet distinctly different motions, will produce the sounds, "der Hund ist klug." The motions are different; but the meaning is the same.

When the sounds and their meaning do not express the thought of the person who speaks, Behaviorism faces a still greater difficulty. Ryle notices it, discusses it for two or three pages, but in the present writer's opinion without much success. Ryle notes that there are hypocrites and charlatans (172ff). Their observable behavior and speech conceal their mind and intention. Hence, concludes the intellectualist, mind is not behavior.

Ryle tries to avoid this conclusion by saying, "The menace of universal shamming is an empty menace. We know what shamming is." Well, we may know what shamming is, but this does not enable us to know whether our acquaintance is now shamming or is sincere. Not only at a given moment, but for long periods of time, and even for one's entire life, one may be deceived by the hypocrite. Or, a hypocrite may be such for only a short time, in a particular context; and after evading whatever trouble he was trying to evade, he may again talk and act sincerely. But how could there ever be any hypocrisy at all unless thought differed from speech? In any case, what has *universal* shamming to do with the argument?

The aim of these comments, interspersed among paragraphs of documentation, is to show that the case for Behaviorism, though it may have one or two fundamental flaws, is also deficient in its subsidiary arguments. Concerning "The Sense Data Theory" which Ryle considers essential to his opponents' position, he says, "I shall try to prove that this whole theory rests upon a logical howler" (213). Perhaps the following comment may convince the reader that Ryle's refutation is the logical howler. But first, to avoid misunderstanding, the reader must be aware that the present writer does not accept the sense-datum theory. He denies that there is any such thing as a sense datum. Yet, since this theory is destructive of Behaviorism, Ryle is obliged to refute it. The point to be made in these comments is that Ryle's logic needs improvement.

He attacks the theory on the ground of its "assimilating the concept of sensation to the concept of observation.... The theory says that when a person has a visual sensation...his having this sensation consists in finding or intuiting a sensum, namely, a patchwork of colors." Here Ryle does not reproduce the theory with precision. The sensation is not a patchwork. It is one color. A patchwork is several sensa. Then Ryle continues,

This means that having a glimpse of a horse race is explained in terms of his having a glimpse of something else, the patchwork of colors. But if having a glimpse of a horse race entails having at least one sensation, then having a glimpse of color patches must again involve having at least one appropriate sensation, which in its turn must be analyzed into the sensing of yet an earlier *sensum*, and so on for ever.

Ryle uses this infinite regress in several places. Here the fallacy is obvious. When chemists began to analyze common compounds, they arrived at elements. This process does not logically require the discovery of elements of elements *ad infinitum*. Now, it may be that the nineteenth century did not correctly identify *atoms*, that is, things that could not be split. But the fact that Einstein or his epigoni split the “atom” is not a logical refutation of the theory that there are elements not further analyzable. A cruder but perhaps clearer example is a jig-saw puzzle. It is composed of a hundred bits of cardboard. But none of these bits is divided into smaller pieces of the picture. It just is not true that bigger fleas have littler fleas to bite ’em, and so on *ad infinitum*. Or to the main point, the *glimpse* of color patches (note the plural) does not entail the possibility of analyzing a single patch into several patches of different colors. So far as empirical evidence goes, no one seems yet to have analyzed the putative simple sense-datum *yellow* into simpler colors.

Furthermore, Ryle makes no effort to define his use of the term *glimpse*. A *glimpse* of colors may not be a *glimpse* of a horse race at all. The observer sees only color; he does not see a horse or a track. People every so often see a variety of colors without recognizing a familiar object. The colors have to be focused and arranged before an ordinary object is visible. Hence there is ambiguity in Ryle’s sentence, “If having a *glimpse* of a horse race entails having at least one sensation, then having a glimpse of color patches must again...” and so on to infinity. The term *glimpse* and the inference to an infinite regress both damage Ryle’s argument.

Now, it is true that Ryle tries to avoid the force of the replies a sense-datum theorist might make. There are essentially two points. First, the sense-datum theorist may deny infinite regress by refusing to “concede that, for a person to be describable as hearing a sound, he must have yet a prior sensation” (215). Ryle’s reply is virtually unintelligible. “Having a sensation,” he says, “is merely a vulgar way of reporting the simple intuiting of a special sensible object and to say that a person intuits such an object does not entail his being in any way sensibly affected.” In other words, having a sensation is not having a sensation. Ryle tries to squeeze out of this obvious contradiction by supposing that angels can contemplate colors, of any intensity, without having sensations. Just how a Behaviorist can know what angels can and cannot do remains unexplained. As for Christians, who believe in angels, they are not compelled to say that angels, any more than God, have sensory experience. Just how any of this supports the thesis that thinking is physical motion is not evident. If Ryle can appeal to angels, we can appeal to God, who thinks though he is indisputably incorporeal.

Should anyone suppose that this reply to Ryle is too cavalier – though it is not more so than Ryle’s argument – we might note that his escape from sensation by the use of the word *intuit* depends on a more intellectualist term than the word sensation. What can he mean by *intuit*, if it is neither intellectual intuition nor sensation?

Ryle’s second attempt to escape the force of his opponent’s replies concerns the direct sensation of colors, but his argument fails because of a misinterpretation of the theory. Using as one of his examples a round plate, tilted somewhat so as to appear elliptical, he denies that the observer sees an elliptical object. Throughout the argument Ryle assumes that the observer sees a round plate, and he also seems to assume that the observer knows that it is a round plate. He explicitly denies “that having a visual sensation is a sort of observation describable as the sensing or intuiting of color patches” (218). But this line of argument is not relevant to the sense-datum theory. It may be that the observer has seen and touched the dishes in the china closet many times, and on this occasion knows that the elliptical sensation will be

replaced by a circular sensation upon turning the plate a few degrees, and knows too that he will have a sensation of hardness if he touches the plate. But all this, the sense-datum theory explains by a series of color sensations, all of which have been integrated so as to form the compound idea of a china plate. The alleged fact that the observer now perceives a china plate has no bearing on the theory that this perception is the result of prior sense data.

To this irrelevancy Ryle adds another unfounded assumption. “When I describe a common object as green or bitter, I am not reporting a fact about my present sensation, though I am saying something about how it looks or tastes.” Isn’t this saying something about the present sensation? Isn’t he saying that the taste, the sensation, is bitter? But at any rate, “I am saying that it [the common object] would look or taste so and so to anyone who was in a condition and position to see and taste properly” (220). If, now we omit the word *properly*, the statement is clearly false. On one occasion my wife and I paid a courtesy call on a younger instructor and his recent bride. They served Rollmops. Obviously the taste they sensed was pleasant. But I was hard put to swallow the abominable things politely. Even now, after fifty years, the sensation remains one of my most unpleasant experiences. Ryle must hold that I was not (never had been, and never later became) able to taste *properly*. When he uses this word, we ask, how can Behaviorism evaluate one chemical reaction as proper and another as improper? Every one is produced according to the same chemical laws. Whatever happens in one test tube is as right and proper as what happens in another.

It is amazing how Ryle can make so many assertions that are obviously false, or if not false, would require lengthy supporting evidence. Speaking of water he affirms that “We can say that ‘painfully hot’ alludes indirectly [?] and *inter alia* to a state of mind. But it certainly does not follow that ‘the water is lukewarm’ and ‘the sky is blue’ allude even in this indirect way to states of mind. ‘Lukewarm’ and ‘blue’ are not adjectives of discomfort or gratification” (221). But why assume that a state of mind or a sensation must be one either of discomfort or gratification? Cannot “green” or “blue” be a sensation without causing pain? The complete argument is plainly a fallacy. Since the following two chapters “Imagination” and “Intellect” depend on the previous confusions, further “deliberate abusiveness” would only increase the tedium.

The Split Brain in Man

Unlike Singer, a great many later psychologists do not think of the philosophical presuppositions or implications of their work. Some do not mention Behaviorism. Many are disinterested in the relation between their theories and the allegations of ethics and religion. They are even less interested in epistemology. No doubt they think their conclusions from experimentation are true, but they do not consider whether truth and its opposite, falsity, can be supported on a physico-chemical basis. Nevertheless, their explicit assertions, sometimes clearly, sometimes less so, necessarily impinge on these fundamental philosophical considerations. In all that follows one must keep this point vividly in mind.

We shall now skip several decades and, to vary the degree of profundity, summarize an article of lesser importance.

Under the title “The Split Brain in Man,” Michael S. Gazzaniga, wrote:

Some fifteen years ago Ronald E. Myers and R.W. Sperry...made a surprising discovery: When this connection [that is, the corpus callosum] between the two halves of the cerebrum was cut, each hemisphere functioned independently as if it were a complete brain.... Was the corpus callosum responsible for integration of the operations of the two cerebral hemispheres in the intact brain? Did it serve to keep each hemisphere informed about what was going on in the other?... To what extent were the two half-brains actually independent when they were separated? Could they have separate thoughts, even separate emotions?⁴

This language presupposes, though it does not explicitly assert, that the brain, the squeezable moist gray

stuff, can think and have emotions. Since the stuff is physical, its activity must be physical motions and chemical changes. Hence the implication is that thought and emotion are physical and chemical reactions, fundamentally identical to what happens in any test tube. Thinking is a visible – visible in principle – chemical operation. The motion is thought.

Dr. Gazzaniga continues:

The demonstration in experimental animals that sectioning the corpus callosum did not seriously impair their mental faculties had encouraged surgeons to resort to this operation for people afflicted with uncontrollable epilepsy.... The operation proved to be remarkably successful; curiously there is an almost total elimination of all attacks.... It is as if the intact callosum had served in these patients to facilitate seizure activity.

From the beginning [of his investigations with Ronald E. Myers, R.W. Sperry, and surgeons Vogel and Bogen] one of the most striking observations was that the operation produced no notable change in the patients' temperament, personality, or general intelligence.

There were some bodily changes, however. The patient seemed to favor the right side of the body; the left side, for a considerable time after the operation, rarely showed spontaneous activity and seemed to be devoid of sensation. The results on the sense of sight were surprising. The patients denied seeing lights flashed on the left side of a visual screen; yet when asked to point the finger to the spots at which the flashes occurred, they pointed to the left half of the screen as well as to the right half. The author then describes other results of this sort.

On a slightly higher level there were surprising results also. When presented with the letters of the alphabet printed on cardboard squares, the patient, using only his left side, could upon command change them into a word. Yet he was unable vocally to name the word he had just spelled.

I am not sure but that this article tells more against Behaviorism than for it. But that the article is Behavioristic a further paragraph clearly shows.

Concerning the patients' perception of red and green lights, their mistaken identifications and fumbblings, Gazzaniga writes,

What was happening was that the right hemisphere saw the red light and heard the left hemisphere say "green." Knowing that the answer was wrong, the right hemisphere precipitated a frown and a shake of the head, which in turn cued in the left hemisphere to the fact that the answer was wrong and that it had better correct itself!

There is further similar language: "The right hemisphere has a very poorly developed grammar." And later, "This showed that the dominant left hemisphere is capable of discriminating between correct and incorrect stimuli."

Why, on this basis, cannot it be said that gold *discriminates* between mercury and lead? Litmus paper discriminates between acid and alkali? This is ambiguous language. Can any part of the brain *see* red or *hear* another part of the brain *speak*? Can squishy ooze *judge* of grammar and *conclude* that an answer is *false*? Or are Behaviorists people who think only with the right half of their brain? And very basically, if thinking is just chemistry, how can the motions of one side of the brain be "true" and the motions of the other side be "false"? In both cases the chemistry is perfect.

This short article is an example of hundreds such. It was so chosen. There are too many others to mention.

[1.](#) *The Concept of Mind*, 1949.

[2.](#) Of course this was not Descartes' position; but Ryle acknowledges that "the official theory" does not come from Descartes alone.

[3.](#) See Gordon H. Clark, "The Limits and Uses of Science," in *The Philosophy of Science and Belief in God*.

[4.](#) *Scientific American*, August 1967

4. B. F. Skinner

For a major contribution one turns next to B.F. Skinner, who is undoubtedly the most influential of all contemporary Behaviorists. From his many publications we select for analysis his more recent volume *About Behaviorism*.¹

In the very first sentence of his Introduction Skinner acknowledges a point which this monograph has already repeatedly emphasized: “Behaviorism is not the science of human behavior; it is the philosophy of that science.” The reader who wishes better to understand the present argument against Behaviorism might well spend some time studying the philosophy of science.

With commendable vigor Skinner jumps right in *medias res* by making twenty specific denials.

Here, for example, are some of the things commonly said about Behaviorism or the science of behavior. They are all, I believe, wrong:

1. It ignores consciousness, feeling, and states of mind.
2. It formulates behavior simply as a set of responses to stimuli, thus representing a person as an automaton....
4. It does not attempt to account for cognitive processes.

Of course it makes the attempt. The pertinent question is, Does it succeed? But to return to the list:

15. If its contentions are valid, they must apply to the behavioral scientist himself, and what he says is therefore only what he is conditioned to say and cannot be true [4-5].

Skinner asserts that all twenty charges against Behaviorism are false. The fourth may be, but I think the fifteenth is true.

Now, Skinner does not quite approve of Watson. “Early Behaviorists wasted a good deal of time, and confused an important central issue, by attacking the introspective study of mental life.... Watson made some rather extreme claims.... In Watson’s aggressive program...it was especially damaging” (5-6). Skinner disagrees with Pavlov also, particularly his use of “the physiological activity of the cerebral cortex.”

Mentalism

In the history of psychology the attempt to search out the causes of human behavior has failed because a mentalistic approach is misguided. To refer behavior to states of mind is to founder on the question, How can an immaterial mind cause physical action? “A more explicit strategy is to...simply describe what people do” (11). Anthropologists and statisticians have followed this procedure.

This will make prediction possible if we assume that people are likely to do again what they have often done before. Yet this “structuralism” is an inadequate method, for it never explains why people follow customary procedures or vote as they do. If such anthropologists and statisticians are asked for explanations, they usually relapse into mentalism or shrug their shoulders [13].

Obviously Skinner wants to avoid mentalism. Equally obvious is his desire to identify causes and give explanations. To do so, he says that a child eats because he *feels* hungry (13); he also defends his use of the words, “I have chosen...I have in mind...I am aware...”(20). Whether or not he can use these mentalistic terms unambiguously remains to be seen. Explicitly he says, “Mentalistic explanations allay curiosity and bring inquiry to a stop” (14).

Kant made a similar point. Somewhere in the *Kritik der reinen Vernunft* he asserts that physics would come to a halt if the world were referred to God. But there is ambiguity here. In one sense it is true; in another sense it is false. Aristotle long ago avoided this ambiguity. In his argument for the First Mover he proves (to his own satisfaction) that there is no first motion, and he also proves that the circular motion of the heavens is the first motion. This paradox is explicable because the word *first* and the word *explanation* both have two meanings and references. There is no first motion in the temporal series of motions. The world has always been as it now is. Plants grow and planets revolve. These motions never

started and will never cease. But there is another reference. Can motion be logically explained? Can all these everlasting motions be explained? For Aristotle they can. There is one motion, as everlasting as the temporal series, on which the temporal series depends. Every subsidiary motion results from the influence or power of the celestial revolution. They depend on it. It depends on no other motion, but on the First and Unmoved Mover. Hence an appeal to God does not put an end to scientific investigation, which concerns itself only with an infinite series in past time. With this in mind, Kant and Skinner must answer whether they mean that explanation proceeds to infinity, or whether there is a first cause. Take a particular phenomenon. Its cause or explanation is *x*. This *x* is then explained by *y*; and *y* by *z*. If now *z* has no further explanation, *x* is explained. But if *z* carries us to infinite alphabets, the explanation of *x* is never finished. This infinite regress may not disturb a scientist; he may simply shrug his shoulders. But for us, there is now no reason for accepting *x*, *y*, and *z*.

The title of Skinner's third chapter is "The World Within the Skin"; and the phrase occurs in other chapters as well. It alerts the reader to Skinner's unquestioned physicalism. "We respond to our own body," he says, "with three nervous systems." This is the kind of language Behaviorists must use, though their theory prevents its use. If the word *body* refers unambiguously to an assemblage of arms, legs, and nerves, what is the "we" who responds to them? Is it not simply some bits of three dimensional stuff referring to other bits of such stuff? And the word *respond* can designate nothing other than a complex of chemical changes. Why then say *we*, *he*, or *she*, rather than *it*?

To say that threenervous systems transmit certain motions from one place to another is intelligible enough; but is it not false to say, "We use the word 'feel' in describing our contact with these two kinds of stimulation"? Indeed, since none of us has much knowledge of the little motions proceeding along the nerves, and since most of us have no such knowledge at all, we can hardly use the verb *feel* to designate what is unknown to us. Skinner has said and will say again that he has no compunctions against using the ordinary mentalist language; but *we*, who are not some physical compound, consider, in a way the contents of a test-tube never do – we *consider* his usage to be a fundamental *petitio principii*.

That the usage is indeed a case of begging the question becomes clearer on a later page. "Statements about future behavior often involve the word 'feel.' Perhaps 'I feel like playing cards' may be translated as 'I feel as I often feel when I have started to play cards'" (28). Here the mentalistic word *feel* is explained by the (what sort of a ?) word *feel*. On the same page he further says, "Consider the report 'I am, was, or will be hungry.' 'I am hungry' may be equivalent to 'I have hunger pangs,' and if the verbal community had some means of observing the contractions of the stomach associated with pangs, it could pin the response to these stimuli alone."

Now, as the heart of a chicken can be kept beating for days after it has been removed from the chicken, and as many of the bodily functions of the human being can be made to continue by medical machinery, it is probably the case that the stomach can be made to contract without the comatose person's feeling any pangs. Or, conversely, if the stomach is removed from the body and is made to go through the motions, Skinner would have to say that the stomach feels hungry.

The chapter ends with a most interesting paragraph:

Even those who insist upon the reality of mental life will usually agree that little or no progress has been made since Plato's day.... Modern psychology can claim to be far beyond Plato in controlling the environments of which people are said to be conscious, but it has not greatly improved their access to consciousness itself, because it has not been able to improve the verbal contingencies under which feelings and states of mind are described and known [32].

Indeed, yes; and the modern effort to explain mental activity in terms of verbal contingencies not only postpones the hope of progress, but renders it impossible. What is needed to make Behaviorism commonly acceptable is the discovery of a new set of laryngeal motions. May it not rather be that the lack of

progress since Plato's day is due to the fact that his view of mind has withstood all criticism? If, however, mentalism is to be discarded, the laryngeal motions can be discovered and described only by a mind.

As was the case with Watson, so too Skinner includes many interesting details, all of which are irrelevant to his main thesis. He talks about "operant reinforcers"; he expresses a liking or disliking of Brahms in eight synonymous sentences; then he does much the same thing for "Wants, Needs, Desires, and Wishes"; following which is a section on "Purpose and Intention" (55ff). These paragraphs are full of mentalistic language, and a Behaviorist cannot claim to have given a rational defense of his use of that language simply by admitting he must use it. He may think, that is, he may behave, that a proper language can later be invented, but evidence comes only with the new language. Skinner does not want to say that "The dog in the Pavlovian experiment salivates in anticipation of food because it 'expects' food" (69). But is the dog so far below the level of us who have learned the meaning of the dinner bell? Skinner would gleefully say, No; neither one expects. But the reason for the dog salivating and our more decorous anticipating is that both of us expect.

Epistemology

Chapter five on "Perceiving" opens with the recognition that "Perhaps the most difficult problem faced by behaviorism has been the treatment of conscious content." One may well omit the "Perhaps." It is rather the whole problem. If this be so, the chapter should contain analyses of earlier theories of perception, with their refutations, plus a very clear exposition of this modern theory. But with a passing mention of "the Greeks" and a bare mention of Plato, the name Empedocles, and eight lines from Theophrastus, Skinner's knowledge of epistemology seems limited to British empiricism. He does not discuss Protagoras' and Plato's theory of perception, nor is there the slightest mention of Plotinus and Augustine. If we may trust the index, Skinner mentions Hegel only once, and then not on a matter of epistemology, while Kant seems to be completely absent. For those who reject British empiricism as thoroughly as and even more so than Skinner does, this difficulty is regrettable.

Unsympathetic with empiricism as the present writer is, there is one objection often brought against it – and though Skinner does not put it in its usual form, it seems to be embedded in what he says – there is one objection that seems quite mistaken. The objection is that simple sensations, such as green, sweet, loud, and so on, cannot be the elements of knowledge because they are discovered only when an already learned investigator of long experience analyzes them out. Thus, it is said, these elements are the result of previous knowledge. But were not the chemical elements discovered and identified as elements only after long experience with compounds? Nobody objected to nineteenth-century chemistry on the ground that what took long to find could not be an element. Now, nineteenth-century chemistry and British empiricism may at this date be both discredited; but not by this argument.

Granted that Skinner did not use the argument explicitly, yet there is a suspicion that he has it tacitly in mind. In any case, his argument is hard to identify. Though he says that the discussion of perception "calls for a certain amount of technical detail, and I shall treat it in some depth," he can hardly be said to have kept his promise. If his conclusions are somewhat clear, his premises are obscure and his logical development from them is uncertain.

He begins with a contrast between the traditional view and the view "common, I believe, to all versions of Behaviorism" (73). The former considers perception an active process; the latter "is that the initiating action is taken by the environment rather than by the perceiver."

This contrast covers over complexities that a rapid reader is almost sure to miss, and in so doing he may unwittingly accept positions that should have been questioned before going further. In the first place one is left to guess whose view is traditional. Previously in this book Locke's view seems to be treated as

traditional, but for Locke and the British empiricists perception or sensation is completely passive. Even Kant catalogued it as receptivity. On the other hand, it was Augustine who considered perception as a voluntary act of attention. But surely Skinner is not engaged either in attacking Augustine as traditional nor in praising him for his (dare we call it) activist anticipation of Behaviorism. In the second place, when Skinner says that the initiating act of perception is taken by the environment, he may be stating a hypothesis to be proven later. It was unwise for him, however, to delay giving his reasons because the statement seems so obviously false.

It may be that thunder and lightning initiate involuntary perceptions; but for many other more ordinary perceptions, voluntary attention is necessary. Most of the time people pay no attention to ninety percent of their field of vision. Even large objects go unnoticed. On a more delicate scale artists realize that there are shadows within shadows. They look for them and see them. Non-artists can hardly see them at all, even when they are told to try. Then there are those pictures entirely made up of sporadic blots of ink. Some people shortly see a face in them. When the pattern is deliberately pointed out to other people, try as they might they fail to see the face – even when they have 20/20 vision. In bodily, physical, or chemical action, the result is uniform and instantaneous. Perception is quite different.

Much of the Behavioristic language is hard to interpret. Whether or not we agree with Berkeley's subjective idealism, we understand well enough that for him the world consists of combinations of sensations. The world is in the mind. For Skinner, as for the non-technical public, "A person could not, of course, capture and possess the real world" (72). Presumably this means that a physical tree cannot transplant itself from the lawn into our heads. Yet he continues to say on the next page, "A part of the environment entered the body, was transformed there, perhaps stored, and eventually emerged as a response."

There are difficulties here. Of course what he says is true of food. It gets inside our bodies and produces a response. This may not be true of taste. Still more doubtful is the case of sight. In the first place, physicists do not know what light is. They used to think it was a wave motion in the presupposed ether. On this basis the waving ether would be stopped by the eyeball so that none of the environment would enter the body. If light is now corpuscular, perhaps bits of corpuscles enter the aperture and make their way to the brain. A corpuscle or two then becomes the tree in the brain.

But there is difficulty in understanding Skinner's paragraph. In its first sentence he asserts that the view to be expressed is common to all previous Behaviorism, therefore to his own.² Yet the concluding paragraph of three lines says, "in an operant analysis and in the radical behaviorism built into it, *the environment stays where it is and where it has always been – outside the body*" (his italics). What then is perception? It is fairly clear that Skinner disowns mental pictures of physical reality. How then does he perceive a tree?

Hurrying on through reinforced responses, Skinner appeals to "a process called generalization" and to "environmental history" (74). One would think that this should be most carefully explained. But he gives no hint even how the most complex chemistry can generalize. In a physicalistic Behaviorism, as much as in subjectivism, or more so, only individual realities are knowable. There are no abstract ideas. Even if Berkeley wanted some general words, his theory did not permit their invention. Behaviorism has an even more difficult time of it. And if generalization comes early in the learning process, as Skinner seems to say, all the more does it stand in need of explanation and justification. It is vain to appeal to "environmental history." We would like to know how this history could have begun. To say that Pythagoras took a long time to figure out his famous theorem is no explanation of the proof.

One of the persuasive elements in Skinner's literary methodology, which for this very reason constitutes a difficulty in criticizing him, is his attack on a theory which the critic himself rejects as mistaken. The

reader is likely to think: Theory X is plainly wrong; Skinner's objections are therefore well-founded; and, obviously to the untutored mind, his presuppositions on this account must be true.

Now, Skinner vigorously attacks the copy theory of perception (80ff.). He acknowledges that photographs and paintings lend plausibility to the copy theory:

It is much less convincing to say that we do not hear the sounds made by an orchestra but rather some inner reproduction.... The argument is wholly unconvincing in the field of taste and odor, where it is not easy to imagine copies distinguishable from the real thing.... When we feel the texture of a sheet of paper, we feel the paper, not some internal representation.

Then he quotes Theophrastus:

with regard to hearing it is strange of him [Empedocles] to imagine that he has really explained how creatures hear, when he has ascribed the process to internal sounds and assumed that the ear produces a sound within, like a bell. By means of this internal sound we might hear sounds without, but how should we hear this internal sound itself?

Then Skinner adds, "Similarly, as a modern authority has pointed out, it is as difficult to explain how we see a picture in the occipital cortex of the brain as to explain how we see the outside world" (81).

This whole line of argument has some force against the copy theory, the representational theory, of knowledge; but it supplies no force in support of Behaviorism.

Some people, even most people, have visual imagery, and this provides some plausibility to the copy theory. But instead of being less convincing, the example of music is more convincing. The violin strings make no sound at all: they cause the air to vibrate. At least such was a recent scientific theory of sound. Theophrastus jumped the track when he assumed that the ear produces a sound within. The ear simply vibrates physically. To assume that the ear produces a sound which the person then hears leads to an infinite regress, as Theophrastus presumably understood. The modern authority too is correct in rejecting a picture in the occipital cortex of the brain. But the difficulty arises because these objections all take perception to be a physical process. If we start with a mind, we may be puzzled as to how to arrive at a body, but we have no such difficulties with perception and thought. May we not suppose that Einsteinian physics makes space and body much more enigmatic than mind and thought are?

Verbal Behavior

A common trait among most if not all Behaviorists is to substitute "verbal behavior" for thought. This is persuasive for the careless reader, who mentally understands the language to designate thinking, when the Behavioristic theory requires no more than motions as truly motions as those that occur on a billiard table or in a test-tube. In chapter six, "Verbal Behavior," Skinner writes,

The words and sentences of which language is composed are said to be tools used to express meanings, thoughts...desires and many other things in or on the speaker's mind. A much more productive view is that verbal behavior is behavior [sic]. It has a special character only because it is reinforced by its effects on people.... As a result, it is free of the spatial, temporal, and mechanical relations which prevail between operant behavior and non-social consequences [88-89].

And through these pages Skinner frequently uses that word "contingencies."

Now, if Skinner, by his phrase "which prevail between operant behavior and non-social consequences," means to modify the previous "spatial, temporal, and mechanical relations," so that the sentence refers only to such noises as the gurgling of some acid as it is being poured through a funnel, which noises have few – they surely can have some – social consequences, he still cannot conclude that the other noises, that is, words and language, are free from spatial, temporal, and mechanical relations. Surely on his own view the motions of the larynx not only occupy space and take time, they are determined fundamentally by the differential equations of physics. Hence the phrase, "the contingencies are different" (89), if true is irrelevant, and if relevant is false.

How Skinner tries to avoid intellectualist or mentalistic objections becomes still clearer in the subsection on "Meaning and Reference" (90-94). The objection, not so much of the structuralism Skinner

explicitly mentions, but more pointedly of the mentalist, is that Behaviorism ignores meaning. Skinner's answer is that meaning is to be found, not so much in the current physical setting, as in "antecedent history," the "history of exposure to contingencies"; "it depends on past contingencies, and nothing is gained by internalizing them" (91).

This appeal to unspecified contingencies in remote history does not explain how air waves, several centuries ago, represent the square root of minus one. Let Skinner complicate the chemistry all he wants, and use as many differential equations as a physicist can give him, yet if he cannot show how a motion in space at the present time designates the concept of beauty, courage, or even hydrogen or velocity, he can never show how the one designated the other many years ago.

Skinner's own example of abstraction is not beauty or velocity, but simply of the color red. One example is as good as another. What then does Skinner say about "red"? The discussion comes under the tertiary title "Abstraction." Hence, even if no one expects to arrive at Platonic Ideas, we expect an explanation of how individual sensations can be developed into universal concepts. Without universals, such as courage, liliaceae, and even red, the contents of the mind, if there be a mind at all, do not merit the name of knowledge. Without subjects and predicates there is no truth, and every predicate is a universal.³

Skinner, however, wants to reduce abstraction to verbal behavior:

A characteristic feature of verbal behavior directly attributable to special contingencies of reinforcement, is abstraction. It is the listener, not the speaker, who takes practical action with respect to stimuli controlling a verbal response.... A person learns to react to red things under the non-social contingencies of the environment, but he does so only by emitting a practical response for each red thing. The contingencies cannot bring a single response under control of the property of redness alone. But a single property may be important to the listener who takes many kinds of practical action on many different occasions because of it and who therefore reinforces appropriately when a given object is called red [93-94].

It may alleviate the tedium of this long quotation to interpolate a remark or two. One notes again the vacuity of the term *contingency*. One also notes the definition of *abstraction*. This is not what Aristotle meant by abstraction, and one must consider whether this new thing can account for what abstraction formerly did. When Skinner pronounces the syllabic sound *abstraction*, and when a Catholic Thomist makes the same noise, their verbal behaviors are identical – as identical as any two instances of a similar sound can be. But the meanings are totally different. Whether Skinner uses the English language properly is one question; but the more important question is, Can Skinner's process, by whatever name it may be called, account for the "property of redness"? Now, back to the quotation:

The referent for red can never be identified in any one setting. If we show a person a red pencil and say, "What is that?" and he says "Red," we cannot tell what property evoked his response, but if we show him many red objects and he always says "Red," we can do so – and with increasing accuracy as we multiply cases. The speaker is always responding to a physical object, not to "redness" as an abstract entity, and he responds "red" not because he possesses a concept of redness but because special contingencies have brought that response under the control of that property of stimuli.

Now, note carefully the following paragraph:

There is no point in asking how a person can "know" the abstract entity called "redness." The contingencies explain the behavior, and we need not be disturbed because it is impossible to discover the referent in any single instance. We need not, with William of Occam and the Nominalists, deny that abstract entities exist and insist that such responses are merely words. What exist are contingencies which bring behavior under the control of properties or of classes of objects defined by properties. We can determine that a single response is under the control of one property by naming it. For example, if we show a person a pencil and say, "What *color* is this?" he will then respond to the property specified as color – provided he has been subject to an appropriate history of reinforcement [93-94].

This passage may be taken as crucial, because a Behaviorist has no hope of arriving at the abstractions of mathematics and physics, not to mention ethics and politics, if he cannot arrive at the concept of red. In this subsection the difficulty is partially obscured by Skinner's decision to occupy the position of an observer rather than the position of a percipient: "it is the listener, not the speaker." Yet if the Behaviorist is to listen to something more than sound vibrations, he must perceive their meaning, and before that the speaker must have somehow developed an abstract concept which he designates by the sound *red*.

Skinner of course denies that the speaker has any concept of red at all. “The speaker is always responding to a physical object, not to ‘redness’ as an entity.” Such is Skinner’s assertion. But the proof is wanting. What evidence there is rather opposes Skinner’s assertion. When a person says “red,” he is classifying the immediate pencil with other red pencils, red squares on a chess board, and red apples. He recognizes a similarity, and similarity is not red. In fact, Skinner gives himself away when toward the end of the quotation he asks, “What *color* is this?” (his italics). Here he falls into a difficulty that even Berkeley with all his subjective mentalism could not handle. People see *red* and *blue*. They do not see *color*. Yet they classify red, blue, green under the concept of color. Now, if the similarity among reds cannot be reduced to or evoked from physical motions, much less the concept of color, and the concept of similarity. Words such as *contingencies* and *reinforcement* are good Behavioristic vibrations in the air. They explain nothing.

We reject the pontifical pronouncement that “There is no point in asking how a person can know the abstract entity called redness.” This precisely is the point. William of Occam at least had perceptions, if not abstractions. Skinner says, “We need not...deny that abstract entities exist and insist that such responses are merely words.” But, first, he has denied the existence of the abstractions which Occam also denied. The only abstractions Skinner allows himself is something Occam had never heard of: a feature of verbal behavior directly attributable to special contingencies of reinforcement. Yet if abstraction in this sentence is a feature of verbal behavior, how can Skinner claim that unlike Occam he will not reduce abstractions to mere words? He should not have restricted his definition on the previous page to verbal behavior. The better word is the sound empty of meaning: *contingencies*.

If anyone object to the assertion that the term *contingencies* is empty of meaning, the reply can be made that in mentalistic terminology it refers to unspecified physical motions in time and space. As such, it provides no meaningful explanation. The contingencies should be specified. This should be clear from one further sentence: “A concept is simply a feature of a set of contingencies which exist in the world, and it is discovered simply in the sense that the contingencies bring behavior under its control” (94-95). Would not this be more clearly expressed by saying that a number of bodies bump a number of bodies and so they are set in motion? This no more explains perception, abstractions, and pain than it does the difference between hydrochloric acid and lead oxide.

Ethics and Politics

The subject with which to conclude the exposition of Skinner’s philosophy will be his ethics. More than once the present treatise has shown that Behaviorism aims to alter morality. Every philosophy does. One therefore wants to know the direction such a change will take, the justification of that direction, and, in the case of Behaviorism, the consistency or lack of consistency between the fundamental principles and the derivative ethics. This matter of consistency can be highlighted by bringing together the first few words of chapter twelve, “The Question of Control” (189) and the last sentence of the final chapter:

A scientific analysis of behavior must, I believe, assume that a person’s behavior is controlled by his genetic and environmental histories rather than by the person himself as an initiatory, creative agent [189]. In the Behavioristic view man can now control his own destiny because he knows what must be done and how to do it [251].

These two sentences, at first sight, seem to be in stark contradiction. Can the intermediate material show that they are not?

Although an individual person does not initiate his own behavior, one must not “overlook the fact that human behavior is also a form of control” (198). Naturally; for if water is dripped on iron, not only does the water rust the iron, that is, *oxidize* it, but at the same time the iron *ferrizes* some of the water. Similarly, if my environmental history, including the cold, wet, foggy weather, produces motions in my

body, called depression, my conduct will cause similar motions in my friends and pet dog. I am their environmental history. This is called control, and “we can no more stop controlling nature than we can stop breathing or digesting food.”

Now, from this more or less scientific observation, Skinner skips to “organized agencies or institutions, such as governments, religions, and economic systems, and to a lesser extent educators and psychotherapists who exert a powerful and often troublesome control” (190). Troublesome? Does the water trouble the iron? The next page has a subhead, “Ethics and Compassion.” How does compassion get into genetic and environmental histories? And benevolence? Before referring such evidently mental qualities to physical “counter-control,” an author surely would have given several paragraphs to a persuasive preliminary argument.

Skinner asserts that “We refrain from hurting others, not because we ‘know how it feels to be hurt,’ but (1) because hurting other members of the species reduces the chances that the species will survive, and (2) when we have hurt others, we ourselves have been hurt” (192). Yet Hitler murdered the Jews in order to ensure the survival of a better human species. Mao massacred thirty million Chinese, and instead of hurting himself thereby, increased the food rations for the survivors. Furthermore, even if certain conduct decreases the species’ chance of survival, what is that to me? After all, evolution will guarantee the survival of the fittest, so that it is no concern of mine what species survives. Indeed, the human race has shown itself to be a natural disaster. Why *ought* it survive?

We sometimes say that we acted in a given way because it was right or felt that it was right; but what we feel when we behave morally or ethically depends on the contingencies responsible for our behavior.... [One does not act] *because* he knows or feels that his behavior is right; he acts because of the contingencies which have shaped his behavior and created the conditions he feels [193].

Hence there is no right or wrong, no obligation, no morality, no praise, no blame. One does not praise or blame nitric acid for burning one’s finger. It is just a natural contingency. So also the murder of innocent babies, the mass murder of the Jim Jones sect, and the murders by the Mafia’s enforcers. Just natural contingencies.

In considering the evils of the present day, Skinner repudiates a book that saw hope in “a growing awareness of each man for his fellows; an increasing respect for the rights of others.” “But what is needed,” Skinner objects, “is a restoration of social environments in which people behave in ways called moral” (195-196). Further down the page he notes that what some societies call moral, other societies call immoral. Remember, however, that what Polycarp called moral, his society thought worthy of capital punishment. Can Skinner justify an individual’s rejection of his society’s norms? Can Skinner justify the norms of one society as opposed to those of another? Can Skinner justify any norms whatever?

Skinner clearly believes that some social arrangements are good and others are bad. For example, individualism brings “the brutal prospect of overpopulation, pollution, and the exhaustion of resources” (201). But if a society calls individualism moral, as America did in 1776, how can Skinner object to it? Any theory that makes social opinion normative has no basis for choosing between two opposing societies.

One must not be deceived by Skinner’s use of mentalistic terms. He cannot write his book without them, for he must talk about matters for which his theory allows no room. “No special kind of mind stuff is assumed. A *physical* world generates both *physical* actions and the *physical* conditions within the *body* to which a person responds when a verbal community arranges the necessary contingencies” (220). Skinner not only admits, he enthusiastically asserts that human beings generalize, discriminate, respond to abstractions and concepts, classify, analyze, derive new rules from old; but “what [Behaviorism] rejects is the assumption that comparable activities take place in the mysterious world of the mind” (223). These enumerated activities are all physical motions in space. Of course Skinner cannot identify these motions

because

The great achievements of artists, composers, writers, mathematicians, and scientists are no doubt still beyond reach (in part, as I have pointed out, because leaders in these fields have been misled by mentalism into giving useless reports of their activities) [223-224].

In other words, there is no empirical evidence that thinking is a bodily motion.

Both in ethics and in scientific experimentation Skinner relies on “effective action.” “A proposition is ‘true’ to the extent that with its help the listener responds effectively to the situation it describes” (235). This, however, is a meaningless distinction, for every chemical or physical action is effective. The chemical reaction may not be what the scientist mentalistically desires – he may have carelessly spilled some acid – but so far as mechanistic science is concerned every motion produces its determinate effect. Complicate the situation so as to include human morals and social customs, and every action still produces its effect. There is nothing ineffective.

Skinner tries to gain plausibility for his Behaviorism by denying that it reduces feelings to bodily states. “It does not reduce thought processes to behavior” (241). Of course it doesn’t. The trick is in the word *reduce*. There was never anything to reduce. It has always been bodily behavior. Behaviorism “simply analyzes the behavior previously explained by the invention of thought processes.”

In the concluding pages Skinner faces the objection that a Behaviorist cannot account for his own behavior: He treats other people as machines, but he is an observer. Though the others have no mind or consciousness, he must have in order to write his book. Part of Skinner’s reply to this objection is consistent: He writes his book because evolution has thus constructed his computerized behavior. He can also legitimately use popular language when technical terminology would confuse the lay reader. His example is that of a physician who tells his patient he has a *cold*, instead of a *virus*. But this is permissible only when *cold* and *virus* can be intelligibly defined. The physician is not permitted to say, *You have a contingency*. A theory also fails if it disallows its own truth. To use the term *memory* in a theory that prevents one from having the same thought twice is not only bad English, it is self-contradiction. Such use of ordinary language confuses the patient more than the technical language would. More of this in a moment.

To be sure, Skinner explicitly mentions this objection: “I may seem to have abandoned the very basis of Behaviorism” (248). He gives his answer in four paragraphs. The first is not so much an answer as it is a reassertion of his theory. The second does little more: “What we have learned from experimental analysis of behavior suggests that the environment performs the functions previously assigned to feelings and introspectively observed inner states of the organism.” In other words, the environment experiments, remembers, and formulates differential equations. “The physiologist will someday give us all the details” (249). But this hope for the future nullifies the suggestion that “we have learned from experimental analysis.” The fourth paragraph says no more. Hence it appears that Skinner has not met the objection.

Skinner indeed, both here and in his conclusion and throughout the book as well, admits without embarrassment that Behaviorism is in its infancy and has solved very few problems. He hopes for the future. But his commendable modesty falsifies his final assertion: “In the Behavioristic view, man can now control his own destiny because he knows what must be done and how to do it.” As of 1979 neither President Carter nor the Congress knows what to do or how to do it.

1. New York: Alfred A. Knopf, 1974.

2. If Skinner transgressed with too little warning the limits of what is common to all versions of Behaviorism, he escapes the charge of contradicting himself. However, the main objection remains.

3. The present writer does not accept the Aristotelian theory of abstraction.

5. Philosophic Criticism

Though Behaviorism has zoomed to heights of popularity in the twentieth century, it is not a new theory. Plato discusses a form of it in the *Phaedo*. Leibniz used the illustration of a grist mill to refute it. Suppose, he said, the brain were enlarged to the size of a mill so that we might enter and walk through it. We would see its wheels and pulleys working on one another, but we would see no thought. I wish to bring this illustration up to date and enlarge upon its applications.

Baseball and Behaviorism

Yankee Stadium is the scene of a baseball game. The first pitch is an inside curve. This represents a particular thought in the brain field, for Behaviorism makes every thought a motion. Now, a given motion is a dated event and cannot occur twice. It may be that a pitch in the third inning is also an inside curve, but it is not the identical pitch. It has come fifteen minutes later. Then, too, its speed is not precisely the same, and the curve breaks about half-an-inch higher. That is to say, the same thought can never occur twice. If I think thought *X* at 2:30 P.M., I cannot have the same thought at 3:00 p.m., or ever after. In other words, memory is impossible.

Perhaps a Behaviorist would say that although we might never have precisely the same thought twice, nonetheless we can have a similar thought. The curve in the third inning is for all practical purposes similar enough to the first one. This reply complicates the situation. The thought that the curve in the third inning is similar to the curve in the first inning is itself a new motion. This new motion will be the knuckle ball in the fourth inning. But this requires the Behaviorist to explain how a motion in the fourth inning can connect the first and third inning motions, when neither of these any longer exists. Each of these “thoughts” had a life span of less than a second. Each is a dated event. The two were separated by fifteen minutes. How can something ten minutes later connect them? Behaviorism therefore cannot discover that two motions are similar.

There is a further complication. It is all the more obvious that neither of these pitches, nor any other in Yankee Stadium, is the motion of a different ball in San Diego. As Yankee Stadium represents one mind and the pitches are its thoughts, so the San Diego diamond is a different mind. Since obviously a single pitch can never occur in two cities, it follows that two minds can never have the same thought. That is why no one else can have the least idea of what Skinner and Ryle mean. And as the previous paragraph has shown, they themselves have no idea what they wrote, now that the writing is finished.

Empiricism

The comments, interspersed among the paragraphs of exposition, sufficiently point out the basic empiricism of Behavioristic philosophy. They briefly indicate objections to that sort of epistemology. Though some may think it out of place to argue about basic philosophy in a psychological monograph such as this, nevertheless a refutation of empiricism would refute Behaviorism *ab initio*. If the sense-data theory is unsatisfactory, as, for example, Ryle insists, then one of two directions must be taken. Either the author, philosopher or psychologist, must pin his hopes on Behaviorism, or he must take the Kantian road to the transcendental unity of apperception; that is, he must acknowledge a unitary soul or mind in order to escape the chaos of Hume’s “impressions.” Since there are these two possibilities, for the moment locating Hegel further along the Kantian road, Behaviorism is obligated to refute the need of a unifying mind. But Ryle mentions Kant only once, merely to dismiss him without argument, and Hegel’s account of sensation in the *Phenomenology*, he mentions not at all. The intellectualist therefore concludes that the

argument for Behaviorism is distinctly deficient.

Irrefragable as this conclusion is, some readers may still think it is too cavalier. For them a subsidiary though pertinent detail may have some weight. With all its scientific and experimental claims, Behaviorism is singularly deficient in that sort of support. Einstein could appeal to the visible position of Mercury. If it were observed in one position at a certain time, his theory could be regarded as probable; but if at that time Mercury appeared somewhere else, Einstein's theory would have been rejected. This then is one challenge that can be directed against Behaviorists: What, experimentally, are the precise chemical reactions that you identify as the idea of the square root of minus one, and what different reactions are thoughts on gravitation or baseball? A good electrician can describe the differences between a circuit that flashes an electric sign advertising *chocolate meunier* and another advertising *creme eclipse*. What then is the empirical evidence that differentiates the chemistry of mathematics from the chemistry that is called the idea of geology?

At the same time I am not willing to minimize the arguments against empiricism. Even with what mind they may have had, Hume and his followers have never been able to justify a universal proposition. They cannot validly establish any law of science. Experience is always finite and induction is always a fallacy.

Ethics

This mention of universal propositions leads to one type that is singularly embarrassing to Behaviorism and should be embarrassing to every Behaviorist. These propositions are the norms of ethics. In fact, Behaviorism not only is unable to say that a certain type of conduct is always good, it cannot conclude that any conduct is ever good or anywhere wicked.

In more than one place the exposition has shown that Behaviorists aim to alter the behavior of human beings. If so, they must have in mind (?) certain ideas of what is preferable to present activities. The methods necessary to produce these alterations are one matter for consideration; the more important matter is whether they have any reason to choose one ideal rather than its opposite. How, for example, can Kilpatrick prove that a government should prohibit parents from teaching religion to their children? How can Behaviorists justify their processes of altering other people? More simply and more fundamentally can the Behavioristic theory validly establish any ethical norm whatever?

Since the documentation and the interspersed comments barely touched on the subject of ethics, it will be necessary now to do a little more quoting. We shall therefore return to B.F. Skinner.¹

According to Skinner,

the prescientific view [held that] a person's behavior is at least to some extent his own achievement.... In the scientific view...a person's behavior is determined by a genetic endowment traceable to the evolutionary history to which as an individual he is exposed. Neither view can be proved...as we learn more about the effects of the environment, we have less reason to attribute any part of human behavior to an autonomous controlling agent.... But the environment can be changed and we are learning how to change it. The measures we use are those of physical and biological technology...[101].

In the following paragraph Skinner acknowledges that this raises questions: For whose benefit is this control to be used? Who is to use it, and to what end? On what grounds can one practice be judged better than another? But the fact that he asks these questions does not mean that his answers are acceptable.

The beginning of the answer is, "There are things which almost everyone calls good." This is not a very good beginning. It subjects the Behaviorist to the unscientific opinions of a large majority, and Behaviorists take pride in being scientific. Since, too, majority opinion might accept several things as good, this principle prevents the Behaviorist from choosing one of these things and rejecting another. Is such subservience good? Probably the majority would say, Yes. There is here a fundamental difficulty.

However, for the sake of proceeding, let the Behaviorist choose two or three of these popular opinions.

These good actions are “reinforcing.” Does this alleged fact recommend them? It seems so, for Skinner says, “To make a value judgment by calling something good or bad is to classify it in terms of its reinforcing effects” (105). But Skinner or at least some Behaviorists might not like to be reminded that Lenin’s and Stalin’s early purges reinforced them to commit extensive massacres. Their success reinforced Mao and Idi Amin to do better, for is it not better to kill more enemies than fewer? While Skinner does not mention the extermination of the Tibetans, he at least says, “the strong threaten physical harm...the physically attractive reinforce sexuality” (109). He may not say so, but his theory implies that massacre and prostitution are good. Of course, “There is a right and a wrong way of driving a car”; so must we not conclude that there is a right and a wrong way to engage in prostitution? How he comes to mention fairness and justice, how he can distinguish between wise and unwise reinforcement – except in the sense of efficiently accomplishing one’s aim – how he can say, You ought to tell the truth (112), remain unclear. His most pertinent assertion is, “The value is to be found in the social contingencies maintained for the purpose of control. It is an ethical or moral judgment in the sense that ethos and mores refer to the customary practices of a group” (112-113). Thus it was ethical, right, good, reinforcing for the ancient worshipers of Moloch to burn their newborn babies in a hot oven. Emancipated Americans kill their babies now at an earlier age.

Skinner seems to think it is enough for Behaviorists to distinguish between facts and how people feel about them. “Once we have identified the contingencies that control the behavior called good or bad and right or wrong, the distinction between facts and how people feel about them is clear” (113). Perhaps it is, but this is irrelevant. Aside from the fact that how people feel about facts is itself a fact, Skinner should give a reason why a person should feel or decide that one line of action is right or better than another. Social contingencies do not satisfy this need. Russian dissidents fight against social control. The early Christians and the Protestant martyrs repudiated the customary norms. It is most enlightening to see how Skinner faces this objection.

He does indeed face it. In fact he quotes a strong statement of this objection as given by Karl Popper:

In face of the sociological fact that most people adopt the norm, “Thou shalt not steal,” it is still possible to decide to adopt either this norm or its opposite; and it is possible to encourage those who have adopted the norm to hold fast to it, or to discourage them, and to persuade them to adopt another norm. It is *impossible* to derive a sentence stating a norm or decision from a sentence stating a fact....

Note now Skinner’s reply: “The conclusion would be valid only if it is ‘possible to adopt a norm or its opposite.’” Apparently he thinks this is impossible; but Russian dissidents and Christian martyrs contradict him. Both adopted their anti-social norms. Indeed the American Congress and the British Parliament constantly contradict Skinner, for they are always enacting laws to alter previous norms. So far as I can see, Skinner never shows how such changes can be reasonably justified or reasonably opposed. From what did Skinner derive his anti-social political programs? All his factual data and social contingencies are irrelevant. One need do no better² than to repeat Popper: No factual statement validly implies a normative conclusion.

This ends what may be called the philosophical argument. Next comes a theological discussion.

¹. *Beyond Freedom and Dignity*, 1971.

². No better, but more at length, the point is made in my *Christian View of Men and Things*, Chapter IV.

6. Donald M. MacKay

Whether a secularist rejects the preceding refutation and accepts Behaviorism, or whether he rejects Behaviorism in favor of some idealistic or intellectualistic theory other than Christianity, he certainly ought to admit that Christianity cannot tolerate Behaviorism. John Calvin stated the position with such clarity that even an Arminian is forced to agree. In his *Institutes* (I, xv, 2) he says,

That man consists of soul and body ought not to be controverted. By the “soul” I understand an immortal yet created essence, which is the nobler part of him.... Christ commending his spirit to the Father and Stephen his to Christ, intend no other than that, when the soul is liberated from the prison of the flesh, God is its perpetual keeper. Those who imagine that the soul is called a spirit because it is a breath or faculty divinely infused with the body, but destitute of any essence [that is, a bodily function, not an independent reality] are proved to be in gross error.... How could an affection or emotion, without any essence, penetrate to the tribunal of God?... For the body is not affected by the fear of spiritual punishment.... Unless the soul survived after its liberation from the prison of the body, it was absurd for Christ to represent the soul of Lazarus as enjoying happiness in the bosom of Abraham, and the soul of the rich man as condemned to dreadful torment. Paul confirms the same point by informing us that when absent from the body we are present with the Lord.

Since believers and unbelievers alike realize this to be the Christian position, it is surprising to see a professing Christian attempting to convert Christians to Behaviorism, even to undermining the passage from Paul quoted in the last sentence above.

The Clock-Work Image

There is no such thing as Christian Behaviorism for the same reason that there is no such thing as Arminian Calvinism or Augustinian Pelagianism. But the Intervarsity Christian Fellowship published and reprinted (1977) a small volume designed to persuade Christian students of the truth of this un-Biblical theory.¹

An argument of 111 pages necessarily has minor as well as major contentions. Some of the former may be unsound without fatally damaging the whole. But if too many inadequacies appear along the line, there is at least a presumption that the main contention is not well founded. Besides this, some apparently minor detail may in its own way be strictly fundamental.

Dr. MacKay opens his Preface by noting that the scientific advances of modern times have caused many deep-rooted superstitions to wither. Those who see little difference between such superstitions and the Biblical religion expect Christianity to wither also. Conversely, Christians are tempted to view science with suspicion and retreat into a private, anti-intellectual faith. Then Dr. MacKay notes, presumably to alleviate the dilemma in which good Christians find themselves, “It is never too easy to distinguish hard scientific data from the philosophical extrapolations from them which are put about in the name of science.”

If I am not mistaken, this statement seems to be an attempt to alleviate the difficulty by assuring Christians that scientists make use of philosophical extrapolations, with the result that their attack on Christianity as superstition has no scientific basis. At the same time MacKay seems to defend science against the suspicions of Christians when they retreat into a private anti-intellectual world. He implies, does he not, that there are in fact hard scientific data free from philosophical and non-observational presuppositions. The sentence quoted therefore puts before us a rather complicated situation. The present writer wishes to deny that there are any hard scientific data at all. Contrary to common opinion, there are no data, no givens, no brute facts. Everything in anyone’s mind is already intellectually interpreted.²

Here is one fundamental point of disagreement. It concerns the nature of science itself. It is so fundamental that many readers will consider its discussion actually irrelevant to a critique of MacKay. If the present writer should base his rejection of “Christian Behaviorism” on this one point, many would

accuse him of evading the supporting details. I shall not evade or avoid these details. Nevertheless, there is an impassable chasm between saying that “it is never too easy to distinguish hard scientific from philosophical extrapolations,” and saying that it is always impossible to do so. Dr. MacKay thinks there are *data*, hard, *given* facts, uncontaminated by intellectual interpretations. Along with the Christian Augustine and the Antichristian Hegel, this is what I deny. For once, most remarkably, I agree with John Dewey on the point that there are no *givens* in science, only *takens*. While it is possible to examine Behavioristic details in an *ad hominem* sort of way, there is always the underlying rejection of empiricist epistemology. Therefore, here at the beginning, I repudiate the basis on which the MacKay book is written, expressed in its Preface in these words: “the Christian gospel itself invites the test of daily experience in *essentially the same spirit* [my italics] of openness to evidence that animates the enquiring scientist” (10). The Scriptural reasons for this repudiation will form the concluding section of this monograph. But for the moment let me emphatically state that Christianity is not based on empirical observation, but on the propositional revelation of divine truth. Tell me, sir, what laboratory observations imply the doctrine of Trinity? Schleiermacher at the beginning of the nineteenth century tried the empirical approach by attempting to derive Christian doctrine from an analysis of the feeling of absolute dependence. In so doing he abolished theology, the study of God, and initiated the psychology of religious experience. This became the Modernism of the late nineteenth century and early twentieth. We want none of it.

Now, first, the documentation will show that Dr. MacKay’s empiricism is one of mechanistic Behaviorism. He does indeed refer to it as a “working hypothesis.” This wording may mean that he believes it to be true, but cannot yet quite prove it so. Or it may mean that it is the most recent of a long series of hypotheses, each to be rejected by the following generation. This is uniformly the fate of scientific hypotheses. But MacKay does not speak as if he thinks it simply the present commonly accepted falsehood. On the contrary, he immediately continues: “In order to maintain human behavior, chains of cause and effect can *legitimately* [my italics] be sought and *found* in terms of physics....(12). Then he disclaims “machine-mindedness” with its “deterministic and depersonalizing” implications; but we much wait to see how or if he can escape physical determinism while asserting the chain of causes and effects legitimately found in physics.

Like Spinoza, Singer, and most of the secularists, MacKay will depend on the principle of cross-classification. That is to say, certain physical processes will happen to produce works of art, others economic systems, and no doubt also something called human decisions. These results of various mechanical causes and effects can be classified teleologically. But individually, the paint of the canvas, the regulatory operations of the bureaucrats, and the motions of a human being walking toward the dinner table are all fixed by the laws of physics. The latter motions may have as their more immediate causes certain chemical reactions in the brain; but the positions and velocities of every part of the brain cells, as well as the feet and legs, are determined by mathematical equations. Cross-classification does not remove mechanical determinism.

For such reasons as these MacKay’s attempt to separate two forms of determinism must be considered a failure. One meaning of the term *determinism*, according to MacKay, is that “all physical events have physical causes” (13). It would be more accurate to say that all physical events are describable by differential equations. The difference between these two expressions depends on the fact that scientists have long ago given up the concept of cause. To return to it indicates a misunderstanding of modern science, and as such constitutes a defect in MacKay’s argument. The laws of physics are today most frequently understood as describing the motions of particles; what causes a body to fall when it is dropped is never answered. What is answered is the rate of fall: It falls with an acceleration of thirty

two-feet per second per second (with some technical modifications).

After saying that “all physical events have physical causes,” MacKay continues, “Even if it were true....” It is strange that he uses the subjunctive mood, for he surely holds that every physical event has a physical cause. This has been seen already, and will be evident later on in his example of the electric signboard. But, “Even if it were true, it would not of itself say anything for or against human freedom and morality.” This statement is surely false, unless freedom and morality are consistent with basic mechanism; and one must say that at least this is extremely doubtful.

The first meaning then was, all physical events have physical causes. If x is the cause of y , and if x occurs, y is inevitable, or x would not have been a cause. MacKay also gives a second meaning to determinism. In this second meaning, unlike the first, freedom, morality, and human choice would be illusory. This second meaning is, “the philosophical belief that the future is inevitable” (13). One must ask, Is there any difference between the two meanings? Or, more exactly, if the first be true, can the second be false? Apparently MacKay thinks so; but how can the future escape inevitability when differential equations describe every action?

MacKay promises to say more on this subject in chapter eight. But in the present context, after referring to the mechanistic redefinition of *guilt*, *love*, and such words, he writes, “note that I am far from suggesting that a mechanistic description of this sort is necessarily untrue” (19). This hardly qualifies as a rejection of mechanism and inevitability. It sounds more like an assertion than a rejection.

A further preliminary detail, though one that leads directly to something fundamental, comes in the sentence, “Finally, if we can establish without obscurantism the fact that man is truly free, then we must ask the question, ‘Free for what?’” Freedom, of course, is MacKay’s more fundamental problem; but here he asks the wrong question. No doubt there is a place to ask, “Free for what?” Birds are free to migrate. A grain of wheat is free to grow – if planted. All this Spinoza said or implied long ago. But however proper, this is a subsidiary question. The main question is, Free *from* what?

Freedom

It is hard to restrict criticism to subsidiary details when the question of freedom keeps poking its nose in at every opportunity. Hence it may be permitted to say a little about freedom even at this point.

Among the numerous flaws in Dr. MacKay’s book there is a gap, one might say a chasm or a void, that runs through it from the beginning on to the last two pages. The author seems anxious to show that his view does not destroy human freedom. But he nowhere defines freedom explicitly. He leaves his readers without a clear idea of what he has in mind. This is a serious omission because in the history of philosophy and theology distinctly different meanings have been attached to the word. For example, Hegel had a very clear conception of what he meant; other people, both politicians and theologians, explicitly reject Hegel’s view. One would like to know whether Dr. MacKay means what Hegel meant or whether perhaps he means what Epicurus, Arminius, or Patrick Henry meant.

Discussing universal history Hegel asserts that in the ancient nations only *one* person was free; in Greece and Rome *some* were free; but in the ideal state all men, man as man, will be free. The final cause of the world at large is the consciousness of its own freedom. But the term *freedom*, says Hegel, is indefinite and ambiguous, liable to an infinity of misunderstandings. The essential nature of freedom involves absolute necessity. The nature of God’s will, that is, his nature himself, is the Idea of Freedom.³ And to summarize later pages, freedom is the condition of each man who performs his specific function in a totalitarian monarchy.

It is fairly clear that Dr. MacKay is not talking about that sense of the term *freedom*; but what sense he is talking about is not clear. The hints that he gives here and there as to what his meaning might be will be

noted as we proceed. He ought to have given his definition at its first mention.

Science

It is worth a parenthetical paragraph to point out MacKay's unfortunate views on the history of science and philosophy. They are indicative of his untenable empiricism. "The modern scientific approach...was not so much an *invention* as a *discovery*" [his italics]. Contrasted with this modern view is "Plato's disregard for the material world" (23-24). MacKay has some reason for disliking Plato, for Plato held that science is always tentative, whereas a discovery is a discovery of unchangeable truth. But in his dislike for Plato MacKay shows his historical ignorance. Far from disregarding the material world, Plato taught that matter was one of three eternal and independent principles. He observed the planets and constructed at least two orreries. He calculated the relative distances between Earth and the planets. Admittedly his calculations were far off our modern calculations, but they refute the charge that he disregarded the material world. These calculations were based on the assumption that the distances were proportional to the distances between the musical notes of the scale; and here again, this time with an accuracy that modern scientists must admire, he defined a whole tone and with it produced the eight-note scale. Furthermore, he had theories about the construction of the physical elements, plus an amount of physiology. In his illustration of the Cave, he admonishes philosophers to return to the darkness of this world, understanding it better after their ascent to the Ideas. Anyone who has ever read Plato knows quite well that Plato did not "disregard" the material world. In Syracuse he even risked his life for his political ideas.

This misreading, or, better, this misrepresentation – for there was no reading – of the history of science is used to lend a certain amount of plausibility to MacKay's argument that it does not deserve. The same page, in fact the same sentence, refers to "the scholastic preference for arguing in an armchair from first principles." In a sense this accusation is true; nevertheless the later Scholastics were empiricists – their fault was that they depended on Aristotle's observations and the theories he based on his empirical material. This is the same mistake most nineteenth century scientists made: They accepted Newton's observations (most of them) and the theoretical formulations based on them. Ernst Mach, Max Planck, and others had to destroy the nineteenth-century synthesis. But as for "armchair" science, Einstein did his famous work in an armchair. We now await the genius of the twenty-first century to put our present armchair in the attic. Science is always invention, never discovery.

Someone may wish to reply that MacKay explicitly recognizes the tentativeness of science (27). Hypotheses are not proved; they merely escape disproof (28). But I doubt that he considers mechanism as a merely tentative hypothesis. The situation is confused. On the one hand he denies that a scientific law is a commandment issued by God, but it is rather our description of the pattern God normally follows (32). Now, this implies that God somehow "follows" laws he did not himself establish. He follows them, but only *normally*. This word requires exceptions to the equations of physics. For example, nearly always the product of the distance and force on one side of a fulcrum equals the other product. But sometimes it does not. This is of course a rejection of mechanism. Therefore the laws of physics are false because laws of physics according to modern theory have no exceptions. The present writer happens to hold that the laws of physics are indeed false, that is, they do not describe natural phenomena. But while MacKay seems to agree on this page, as we have seen, he has insisted that these laws are not inventions, but discoveries. More specifically physicists of this type claim that they have discovered that these laws have no exceptions.

MacKay's main argument seems to require an unbroken mechanism. His main illustration of the brain-mind is that of an electric sign. The circuits are fixed mechanically. But by a cross-classification there is

an advertisement which the circuits do not (explicitly) describe. More will be said of this. At the moment, however, his acceptance of the mechanical ideal, and the notion that science is discovery, seem to be indicated by the relation he draws between Newton's law of gravitation and Einstein's relativity. His words are, "if an hypothesis has run the gauntlet for a reasonable length of time, then anything that replaces it is likely to include it as a special case – in the way Einstein's theory of gravitation includes Newton's." (28).

To this I reply, first, Newton's formula is not a special case of Einstein's. It is mathematically impossible to deduce Newton's equation for the addition of velocities from Einstein's equation. MacKay's willingness to use poor mathematics to defend the truth of Newtonianism is evidence of his acceptance of the mechanistic philosophy.

This now brings us to the illustration of the electric sign. The scientist, he says (34) would like to describe the world as it is. Since the scientist himself is a part of the world, he would like to describe himself too. But then how can he maintain scientific detachment? This, MacKay considers "something of a paradox." To solve it he resorts to a device reminiscent of the medieval theory of a two-fold truth:

Scientific knowledge is knowledge from the outside – a spectator's knowledge. The scientist does not – or at least has no scientific reason to – deny that there are whole worlds of knowledge of a different sort to be gained by allowing oneself to get personally involved – in relationships between people or in artistic or religious commitment for example – so long as we distinguish it from *scientific* knowledge [35].

One regrets that MacKay paid no attention to what he called "something of a paradox." It might have shaken his confidence in "scientific detachment." Even among non-Christians there are practicing scientists who base their theories on artistic, religious, or moral foundations. And surely this is the Calvinistic view of science. But let us return to the idea of a two-fold truth.

MacKay holds that there is no scientific reason to deny whole worlds of knowledge of a different sort. He should have given his reasons, for many scientists disagree. Karl Pearson said,

The goal of science is clear – it is nothing short of a complete interpretation of the universe. Science does much more than demand that it shall be left in undisturbed possession of what the theologian and metaphysician please to call its legitimate field. It claims that the whole range of phenomena, mental as well as physical – the entire universe – is its field. It asserts that the scientific method is the sole gateway to the whole region of knowledge.⁴

One could also quote the later authors A.J. Carlson, Hans Reichenbach, and Ernest Nagel. Can MacKay answer these scientists? There is no answer in *The Clock-Work Image*. In particular, the Behaviorists, whom he wishes to follow, and all those discussed in the earlier part of this monograph deny his assertion. Philosopher John Dewey very vigorously denied it.⁵ It is clear therefore that MacKay has a different view of what science is. Or, perhaps, he oscillates between two views. Regardless of science, however, there are absolute reasons for rejecting every theory of two-fold truth. There are indeed different areas of truth. One may speak of botanical truth or astronomical truth. Within any single science there are a thousand objects to be known. But an epistemology must justify all truth on the basis of a single system under pain of suicidal schizophrenia. On this point the exponents of Unified Science are correct – there is just one "sort" of truth, though it is not what Unified Science has.

The Mind Electric

MacKay now illustrates his two sorts of truth by the illustration of the electric sign; and the illustration depends on the principle of cross- classification. First, "no part of this world of observable events is outside the boundary of scientific study" (36). Hence, contrary to the implications of page 32, mechanical law describes or determines all motions without exception. Even human action is mechanical, subject to the laws of physics and chemistry. This is the language of Karl Pearson. The electric sign in Picadilly Circus is completely described by its circuits, "so complete[ly] that we understand just *why* and *how* [my

italics] each lamp is flashing” (37).

Actually, however, this is not the case. MacKay has sufficiently described the circuits; that is, he indicates that the arrangements of the wires can be set down on paper. But he nowhere indicates how he understands the *why*. Nor has he explained any kind of connection between the two. This is a rather serious omission.

“Now suppose,” MacKay continues,

that some argumentative person complains that this painstaking description is still incomplete, on the ground that it has failed to mention the advertisement.... Well, in a sense, of course, he is right. There *are* words on the board and the electrician indeed has not mentioned them. But does this mean...that there were some parts of the board that were “outside his boundaries”? Of course not.

Note again the presupposition of inviolable mechanism. “The electrician...has in one sense accounted for every object and event on the board.... What he has not accounted for is the thing as a whole.” This is essentially Singer’s theory of average common result, and one must note that the actual circuit determines what words appear. “To me this is a helpful picture of the kind of connection there is between the scientific description of the universe and the Christian description” (38).

Though the eminent gentleman thinks his illustration helpful, he has neglected to show that mechanism and Behaviorism can produce any intellectual meaning at all. How can he develop mental or spiritual reality out of electric circuits? His illustration presupposes a rational engineer who, outside the electric circuits, planned and uses them to convey significance. But Behaviorism allows no one to be outside. Now, MacKay’s view would not be so thoroughly Antichristian if the engineer is regarded as the soul of man. Man has nerves, feet, organs, and the soul directs their actions. Has MacKay undermined Behaviorism by smuggling in this engineer? No, I do not think so. This would be such an inconsistency that it is hard to believe that it is the correct interpretation. There is another way of taking the illustration, and it seems to be what MacKay intended.

Although one may be inclined to take the electrician himself as the figurative representative of the soul or mind of man, MacKay might reply that man has no soul and that the electrician represents God, who made men like electric circuits. The sign itself is totally soulless and totally mechanistic. If this is the case, we may note that the sign itself, that is, the human person, has no voice or decision in what the sign advertises. Then also we may ask how one electric sign can convey its message to another electric sign across the street. Electric circuits have no understanding. It takes intelligence to read signs. How can the Bovril sign get its message across to the Schwepps sign? MacKay does not clearly answer this question. In fact, I would say he does not answer it at all.

Furthermore, the electric sign cannot provide the freedom MacKay wishes to base on it. To modify this statement, one must express doubts as to what sort of freedom MacKay has in mind. He surely cannot defend freedom from mechanistic law. We may have to conclude that he satisfactorily arrives at Spinozistic freedom but not at Christian freedom.

He begins his defense of freedom with a chapter on “Nothing Buttery” and reductionism. Once again he asserts that mechanism is inviolable: “No advertiser in his senses would imagine that he must deny the completeness of the electrician’s account in order to defend the real presence of his message” (44). We ask, Is this “real presence” Romish or Reformed? Of course the advertiser does not deny the completeness of the electrician’s account of the circuits; but an ordinary advertiser would deny that this account explains the virtues of his product. It was the advertiser, not the electrician, who first wrote out the message. And this writing took thought, not electric circuits. But in Behaviorism the thinking of the advertiser and all the moral choices of human beings are physical motions in accord with the equations of physics. To disguise this, MacKay states, “The pattern of lamp flashes could not have been the same, if the moral choices had been different.” Of course they could not have been different, for in Behaviorism

the flashes are themselves the moral choices. There is no soul, there are only circuits. For Behaviorism the circuits not only make the message, they are the message. The quoted sentence therefore is misleading. It is Behavioristically true, for the flashes and the choices are the same thing; but the language suggests to the Christian, who does not automatically think in Behavioristic terms, that the moral choices determine the construction of the circuits.

Accordingly, MacKay's sentence does not help his defense of freedom. Since for him physical laws are discoveries, not inventions, since they are without exceptions, they could not be regarded as possibly different. Hence, given the circuit, the message could not be otherwise than it is. No moral choice can alter the mechanism that has produced it. MacKay's moral choices are mechanically necessitated.

God and Creation

It is at about this stage that MacKay begins to discuss the relation between the world and God. His view of creation is not clear: "Chance in the sense of chaos is indeed recognized (*Genesis* 1:2), but only as something banished from the world by God's creative word" (49). This seems to say that there was a physical world of chaos before God created the cosmos. This is similar to the work of Plato's demiurge. Yet two pages later he says, "God has conceived and made our world out of nothing." Then later he says, "Creation...is not just a single datable event which happened at a particular time; it is rather a continuing relationship of dependence between us and God" (69). How does this fit in with "Let there be light, and there was light"? How also does a continuing relationship between God and man fit in with "And on the seventh day God ended his work...and rested...from all his work which he had made"? Has not MacKay again contradicted himself? That the world is now upheld by the power of God is undeniable; but creation out of nothing must be instantaneous. It must therefore have a date, though we have no idea what the date is.

In the chapter on "Creation, law and miracle" MacKay defends God's control of all events. He does this to avoid the defense of theism that depends on a few odd events that science cannot as yet explain. "If God is active in any part of the physical world, he is in all. If the divine activity means anything, then *all* the events of what we call the physical world are dependent on that activity" (57). Well and good; it deserves emphasis. But it is irrelevant to the present issue. There are two difficulties here. First, why cannot God have created souls as well as bodies? Why cannot there be minds as well as circuits? Does not Christianity assert the existence of spirits? God himself is a spirit and has not a body like men. How can Behaviorism accommodate God at all? Then, second, does God control all events by mechanical laws? The present writer wholeheartedly accepts divine teleological determinism. As the *Shorter Catechism* says, "God's works of providence are, his most holy, wise, and powerful preserving and governing all his creatures and all their actions." But it does not follow that all his creatures are totally corporeal and mechanical. It is mechanism that this monograph opposes, not divine sovereignty. MacKay insists on Behavioristic mechanism. Only two pages later he argues that the divine artist creates "a chain-mesh which scientifically-minded observers can discern in the pattern of events." They *discover* mathematical laws. "In other words, any event in the created scene should be 'causally explicable' in terms of earlier events" (59). The idea of *discovery*, which guarantees that the processes of nature are mechanical, recurs at the bottom of the following page also.

Yet MacKay oscillates. He uses the phrase "normally according to the [divine] pattern of today" (63). This suggests exceptions to the causal chain-mesh that binds all events. Then again, "The fears expressed by some believers that to accept the possibility of miracle in the biblical sense would make nonsense of the whole scientific enterprise, are fundamentally groundless" (65). Now, it is not clear what MacKay thinks the Biblical concept of miracle is; I should suppose that unbelievers consider it to be an exception

to the normal laws; and this indeed makes nonsense of the whole scientific enterprise as defined by naturalism and Behaviorism. A chain-mesh that includes every event has no missing links.

Though MacKay throws such exceptional crumbs to believers, his main concept is mechanistic. He speaks of the “mechanisms of the brain” (67), and of “what science has achieved so far in its mechanistic understanding of man.” He claims, and I believe falsely, that these achievements “in principle leave untouched the validity of what the Bible has to say about him.” I shall substantiate my charge of falsity in a concluding section. Here I am only supporting my contention that MacKay is basically a mechanist. Just below the previous quotation he writes, “By ‘the scientific enterprise’ I want to denote all attempts to understand man as a phenomenon in causal terms: in terms of physical chemistry at one level, physiology at another....” This of course is what Skinner depends on to manipulate all of us to favor his political and social totalitarianism.

The basic mechanism appears again in MacKay’s interpretation of a Biblical passage:

The early passages in the Bible say that “man became a living soul.”...A living soul...is something we *become*.... There are no grounds for the notion that the Bible teaches that man’s body is like a kind of chariot, or a motor car with controls which must be “open ended” for something non-physical to influence them. If we start with that sort of presupposition I think we get into trouble not only with mechanistic physiology, but also with Scripture itself [70].

In the first place, it is clear that MacKay does not want to get into trouble with mechanistic physiology. For him man is a machine. Presumably he does not want to get into trouble with Scripture; but here he fails. If we ignore the rather unfortunate reference to chariots and motor cars, we may note that the Bible teaches the precise opposite of MacKay’s theory. The Bible very explicitly says that God fashioned man’s body out of the earth. He formed a clay statue, so to speak. Then God breathed his spirit into the clay statue, and the combination of clay and spirit is called soul. MacKay picks up the Hebrew word *nephesh*, but he totally ignores the Hebrew word *ruach*. As he says, *nephesh* can perhaps be translated *organism*, or perhaps “mind-body.” But he says nothing about the *mind* alone. The Bible very definitely says that the mind or spirit was introduced into the body after the body had been sculpted out of earth. God had formed the body’s nostrils, and lungs, into which he breathed his spirit, and by God’s breath man became a mind-body. It is the last ditch stand of a Behaviorist who wants to be a Christian to ignore this part of a passage he quotes.

After a few more pages on “nothing-buttery,” MacKay returns to his computer or electric sign. His concluding paragraph begins, “If, then, our human personality is related to our bodies in anything like the way that a message or computer program is related to its embodiment, it is clear that brain science has absolutely nothing to say against the possibility of eternal life” (73).

There is a further point in his concluding paragraph that we should not ignore; but let us consider this much now. In contradiction to his statement that Behavioristic brain science has nothing to say, or imply, about eternal life, one may point out that if the electric signboard is destroyed by some catastrophe, no message remains. At death the message passes out of existence; no life is left at all. To avoid this refutation MacKay offers an allegedly Scriptural explanation, but it is an explanation in which the most pointed Scriptural material is passed over in silence.

Freedom and Responsibility

We must now descend into the labyrinths of freedom. Is there a place for freedom and responsibility if thinking is a physico-chemical function of the brain? MacKay does not really define freedom. In a certain place he describes one characteristic of freedom, but it is hardly a formal definition. In any case that place will be considered. What comes closer to being a definition is paragraph 14 on page 110:

14.... What I want to point out is that by calling a man “free” we might mean one of two quite different things: (a) We might mean that

his action was *unpredictable by anyone*. This I would call the freedom of caprice; or (b) we may mean that the outcome of his decision is *up to him*, in the sense that unless he makes the decision it will not be made, that he is in a position to make it, and that no fully-determinate specification of the outcome already exists, which he would be correct to accept as inevitable, and would be unable to falsify, if only he knew it [110].

To this MacKay adds a reply to a possible objector:

15. “Does not your theory contradict the Bible’s teaching that God always knows how people will respond to his communications to them?” – Nothing in what I have said denies that God-our-creator knows, and is sovereign over, every detail of our past, present, and future. What I do argue is that this divine foreknowledge is not something that we could be correct to believe if only we knew it – since for us (unlike God) this would involve a self-contradiction.

This fourteenth paragraph calls for analysis. In meaning (b) the phrase “unless he makes the decision it will not be made” is a superfluous tautology. That the man is in a position to make it is equally such. The important point is that God has no omniscience, no knowledge of a future event, that the man would be correct to accept as inevitable. But if God knows an event is inevitable, then *ipso facto* it would be correct for any man to believe it. How can a belief that is true be incorrect when a man believes it? Is a correct belief ever a false or incorrect belief? Perhaps MacKay means that it would be improper or sinful for this man to believe the truth. But how can believing the truth be sinful? Believing unrevealed truths may be impossible, or possible only by accident, but this does not seem to advance MacKay’s argument.

It follows, presumably, that the final phrase of the definition is the important one: “and would be unable to falsify, if only he knew it.” The condensed definition for freedom therefore becomes, God can have no foreknowledge that a man would be unable to falsify, if only he knew it. This means that a man is free only if he could falsify God’s knowledge by knowing it. That is to say, a man, to be free, must be able to avoid the inevitable by knowing that it is inevitable. Is not this nonsense? At any rate, in a moment we shall consider MacKay’s earlier explanation.

Here, however, paragraph 15 claims that man’s hypothetical knowledge of an inevitable event is a self-contradiction. Paragraph 16 cites an opponent’s reply that Christ knew his death to be inevitable: You destroy this temple and in three days I shall raise it again. But MacKay says, “Christ indeed recognized... the will of the Father for him...but this did not mean that...he would have been correct to regard the outcome as already fixed and inevitable.” This means that Christ did not know that the Lamb was slain from the foundation of the world, that he did not consciously come to give his life a ransom for many, and that he could have prevented the crucifixion, had he known it was inevitable.

MacKay argues that Christ could not have known the prophecy, for knowing it would have involved a self-contradiction. The explanation of this remarkable situation comes in an earlier section (78-87). The account is very confusing.⁶

MacKay begins by stating an objection: “If our brains were as mechanical as cash registers, then surely before we made any choice the outcome would be already fixed and inevitable, if only we knew it?... I believe that it contains a logical fallacy.”

Two points at first attract one’s attention. Since MacKay says that the argument is a fallacy, he presumably means that he accepts the premises and denies only the inference. Therefore this documents his position that thinking is a mechanical motion of the brain. Second, the phrase, “If we only knew it,” does not seem to fit. If our brains were mechanical, and if the motions of our brains were thinking, the resulting choice would be inevitable, whether we knew it or not. Why he ended the sentence with a question mark is unclear. But we shall see a most peculiar twist, for MacKay will base his argument for freedom on the difference between knowing and not knowing the coming event. By this he hopes to produce a self-contradiction in the notion of inevitability.

Accordingly he begins by considering the possibility that someone (God) “could successfully predict *secretly* the outcome of a decision we have not yet made.” It is strange that he speaks of the outcome of a

decision. The important thing is the decision itself. In the matter of Behaviorism the interest centers on thinking or mental action, not on physical motions. Of course Behaviorists deny the distinction, and we may well admit that the inevitability of the physical motions that result from mental decisions is germane and important. At any rate, MacKay asks, "Would this predictive knowledge of his [God's omniscience] prove that the outcome was all along inevitable for us, if only we had known it?"

Note again: "if only we had known it." Note again also that this is irrelevant. A predestined act or decision is inevitable whether we know or do not know what the action is ahead of time.

"Oddly enough, it would not," MacKay oddly continues. God's prediction, if we did not know what the prediction was, would have been "inevitable *from the standpoint of the detached observer*. But before he could claim that it was inevitable for you, he would have to show that this is also the outcome you would have been correct to accept as inevitable, if only you had known it" (79).

Here MacKay has begun to shift his meaning of inevitability. In fact he is no longer talking about inevitability. He is talking about two persons, God and man, knowing or not knowing that an event is inevitable. This completely misses the force of the objection. One must note the ambiguity of the word "for." MacKay wants to say that if an event is not inevitable for someone, the event is not inevitable. Here to be inevitable or avoidable for someone simply means that the person knows or does not know. In the absolute sense it was inevitable for Judas, and for everybody, that Judas would betray Christ. But a year before the event Judas did not know it was inevitable. He probably had not formed any such plan at that time. Now, if one say that therefore the event was not inevitable for Judas, one means nothing else than that Judas did not know what he was going to do. But this is only a matter of Judas' mind. It has nothing to do with inevitability. Whether Judas knew it or not, it was still inevitable. The word *for* is simply obfuscation. It had better be dropped. An event is inevitable or not. Only in one peculiar circumstance does it make any difference who knows it or who does not know it.

MacKay's argument now becomes even more confused, if that were possible. He wishes to prove that "your immediate future is not inevitable for you." The half page that precedes this conclusion is as follows:

The basic point is that (according to mechanistic brain theory itself) what you believe, accept as inevitable, *etc.*, is represented in some precise sense by the state of your brain. Thus no completely detailed description of the present or immediately future state of your brain could be equally adequate whether or not you believe it. If it were accurate before you believed it, then when you believed it your brain-state must change in some respect, so that the description must be out of date and you would be in error to believe it.

In short, the present and immediately future state of your brain, however predictable by a detached observer, has *no completely determinate specification* that *you* would be unconditionally correct to accept, and in error to reject, if only you knew it. In that sense, your immediate future is not inevitable for you. To put it otherwise, no completely detailed specification of your immediate future can exist, upon which both you and all observers would be correct to agree, until after the event. The observer's data, even if he shared them with you afterward, would only confirm this peculiar logical fact about the situation at the time you made your choice, the fact that it was "logically indeterminate" [79].

Perhaps an example from the kitchen may clarify this confused argument. God has predestined me to burn my hand as I fry an egg. The natural sequence of events, or combination of causes, is that I take an egg out of the refrigerator, put it in the pan, and turn on the gas or electricity. These three conditions, which we may designate symbolically as (p, q, r) , are not the total cause. In addition there is the condition (k) , namely, that I do not know the stove has become defective and that there will be a flash when I turn it on. Of course, if I knew this, the usual thing would be not to turn on the stove. Then the inevitable event, which God foreordained, would not take place. There are several things wrong with MacKay's construction at this point.

First, in the ordinary course of events (k, p, q, r) must result in my burning my hand. But if (k) is replaced with (k') the result does not occur. However, this does not abolish inevitability. It abolishes the inevitability that I burn my hand; but it establishes the inevitability that I do not burn my hand. Naturally

two different sets of causes do not produce the same result. When ignorance is one of the factors, it is no surprise that knowledge will alter the result. But it must be remembered that God had not only determined that I burn my hand, but also that ignorance would be a necessary contributing factor.

Second, underlying this kitchen example is not only the uselessness of the phrase “inevitable for me,” but also the fact that the contradiction MacKay attributes to his critics applies actually to himself. A logical analysis of his argument on page 110 and earlier shows it to be a form of fallacy that makes logic textbooks interesting. Two examples will more than suffice.

A silly argument against God’s omnipotence lies in the question, Can God create a stone so heavy that he cannot lift it? If he cannot create this stone, his power is limited, for here is something he has not the power to do. But if he can create this stone, and cannot lift it, he is not omnipotent, for here is something he cannot do. Therefore God is not omnipotent. This is similar to Bertrand Russell’s famous barber, who shaves all those and only those who do not shave themselves. The question then is, Does the barber shave himself? If he does not shave himself, he must shave himself, for he shaves all those who do not shave themselves. On the other hand, if the barber does shave himself, he cannot shave himself, for he shaves only those who do not shave themselves. In both examples, the stone and the barber, the premises contradict one another. Since the positing of a contradiction makes nonsense, neither of these examples sets any problem. They state a logically impossible situation and there is no problem to solve.

This is also the case with MacKay’s argument. His premises are incompatible. No situation can combine God’s predetermining my ignorance, my having the knowledge God refused to give me, my burning my hand, and my not burning my hand. In other cases, where God does not use ignorance as a condition, knowledge and ignorance have no bearing on inevitability.

Coming closer to Scripture, a Christian knows by revelation that Christ will return; in the absence of revelation he does not know the date. But the event of the return and the precise time are equally inevitable. Only if God had made our ignorance a determining cause of the date, could our knowledge of the date make the date false. But since God predetermined our ignorance, the supposition that we might know the date is contrary both to fact and to Scripture.

There is a Scriptural example of this. God had determined to destroy Absalom by making him believe false advice. Had he believed Ahithophel instead of believing Hushai, presumably he would have destroyed David. But believing Ahithophel was not a possible condition, “for the Lord had determined to defeat the good counsel of Ahithophel, to the intent that the Lord might bring evil upon Absalom” (2 Samuel 17:14).

Scripture versus Behaviorism

The preceding arguments claim to expose Dr. MacKay’s fallacies. What now follows claims that Scripture teaches the falsity of Behaviorism.

Scripture asserts the existence of God, angels, Satan, and demons. None of these has a body. None has brains. Nothing about them can be described by mathematical laws. Yet they all think. Of course secular Behaviorists do not believe in God or demons. This is now immaterial (!) because the present argument aims only to show that Christianity and Behaviorism cannot be harmonized. Maybe a Christian (?) Behaviorist would claim that he has been thinking only of human beings. But if he has been thinking of thinking, his theory of thinking should apply to all beings who think. Obviously it does not.

Without any diminution of the conclusive force of this consideration, there are other Scriptural themes that completely refute Behaviorism. One bears repetition, namely, in *Genesis* God fashioned a physical body which could not think, then he breathed his spirit into the clay, and the combination made a living man. But before receiving the spirit the physical brain could not think.

There are also two other themes in Scripture that show Behaviorism to be incompatible with Christianity. Presumably all Christians remember the second and chronologically later event; the prior event is not so prominent in our minds. Yet every Christian remembers that Moses was not permitted to enter the promised land because of a sin he had committed. "He went up from the plains of Moab...to the top of Pisgah.... So Moses the servant of the Lord died there in the land of Moab...and he [the Lord] buried him...but no man knows of his sepulchre unto this day" (*Deuteronomy* 34:1-6). In the course of a century or so his brain decomposed, and after fifteen centuries or thereabouts there could have been very little left of his body. Nevertheless, Moses kept on thinking without brains or body, for on the Mount of Transfiguration Moses held a theological conversation concerning the doctrine of the atonement with a refulgent Jesus, who may not have been using his brains either (*Luke* 9:29-31).

The second example is that of Jesus and the thief on the cross. Jesus said, "Today you shall be with me in Paradise." By sunset the bodies of Jesus and the thief had been buried. They were dead. Their brains were inoperative. Yet the two persons were enjoying Paradise. No doubt the thief was praising God for his unanticipated salvation. That is to say, he was thinking, but not with his decomposing brains. Thinking is not a function of brains.

Now, finally, like the thief on the cross and like Moses, some of our friends have died; we too shall die, unless Christ returns within a year or two; then being dead, our brains and body being buried, we also shall engage in theological discussions with Christ and those who preceded us there. Theology does not require brains; it requires a mind or spirit; and Behaviorism is a denial of the Gospel.

- [1.](#) Donald M. MacKay, *The Clock Work Image*, 1974.
- [2.](#) To include even closely related side issues in this monograph would extend it immeasurably, but that there are such may be indicated by a reference to Otto Neurath and Logical Positivism. In his "Protocol Sentences" (*Logical Positivism*, edited by A. J. Ayer, 1932, 199) Neurath believes he can achieve a physicalistic language free from metaphysics, though it can be used only for parts of the special sciences. He seems disappointed that "there is no way of taking conclusively established pure protocol sentences as the starting point of the sciences." We can eliminate metaphysics, but vague linguistic conglomerations always remain. On the contrary, it is my opinion that metaphysics and theology can never be eliminated. It would be interesting to know to what extent MacKay has been influenced by Logical Positivism.
- [3.](#) Partially verbatim; *Selections* by Loewenberg, 362-363.
- [4.](#) *Grammar of Science*, 1911, 14, 24.
- [5.](#) *The Philosophy of Science and Belief in God* and Dewey.
- [6.](#) See William Hasker, "MacKay on Being a Responsible Mechanism"; and Hasker, "Reply to Donald MacKay," between which is MacKay's rejoinder; all in *Christian Scholars Review*, VIII, 2, 1978.